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January/February 1988
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see page 17

Issue 31

January/February 1988

'The Magazine for the Dedicated Atari User'

LISTINGS

FEATURES

REVIEWS

STAGE the PAGE 6 ST section

REGULAR DEPARTMENTS

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On sale 25th February. Copy date 15th January.

PAGE 6 is published bi-monthly on the 1st of each alternate month.

PAGE 6 is a users' magazine which relies entirely on readers' support in submitting articles and programs. The aim is to explore ATARI computing through the exchange of information and knowledge. We will pay for articles and programs where appropriate and we hope that readers will enjoy seeing their work published. In turn we hope that other readers will learn from the articles and programs submitted and increase their enjoyment of Atari computing.

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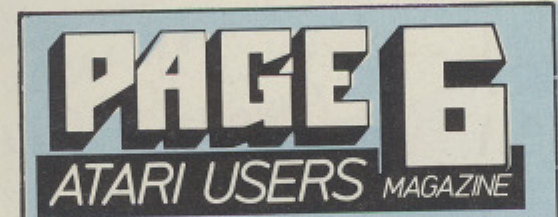
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Issue 31 Jan/Feb 1988

'The Magazine for the Dedicated Atari User'

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THE CREDITS

Full 'official' credits are on page 3, here are the people who made it possible.

Les Ellingham did the Editing

Nicola Parry looked after the ads

Phil Cardwell gave valuable Editorial Assistance

The **Regular Contributors** are ...

Garry Francis
Mark Hutchinson
Matthew Jones
John Davison
John Davison jr
John Sweeney
Paul Rixon

The superb Cover illustration and sundry other illustrations (also last issue) are by **Barry Armstrong**

All other contributors for this issue are credited alongside their articles or programs. Thanks to everybody for contributing and thus helping others.

Helping long into the night for this one were Bruce Hornsby, Eurythmics, Van Morrison, 10,000 Maniacs, Clannad, De Dannan, Bruce Springsteen and Heart. Teddy O'Neill and Savage are two of the very best not to mention the Poetic Champions. Phil listens to nothing but Jean-Michelle Jarre and Abba(!). Still it takes all sorts!

Serious? You bet! But Atari is supposed to fun as well isn't it?

The next issue of PAGE 6 could feature YOUR article or program. So, send it!

PAGE 6 is put together almost entirely with Atari equipment and software. Hardware used: 130XE, 1050 disk drive, 810 disk drive, 850 Interface, modem, NEC 8023 printer, 1040ST, SM124 monitor, Atari SH204 hard disk drive, Epson RX100 printer, Microstuffer Buffer. Software used: Superscript, Turbo Basic, Tele-Talk, Kermit, Print Wiz and several custom written utilities on the 8-bit. STwriter, PC Intercomm, Thunder and Fleet Street Publisher on the ST.
Copy is prepared on a 130XE using Superscript and various custom written programs and then transferred to the ST via 8-bit Kermit and PC Intercomm. It is then spell checked with Thunder and the layout drafted with Fleet Street Publisher. Finished copy is output from the ST to a Konnect 2 cassette machine and then fed into a Monotype Lasercomp typesetter.

Editorial

YOU CAN WRITE TO US

Well, this is our third issue on the newsstands but such are the vagaries of the news business that we still don't know exactly how many of the first issue we sold! We are proud to be dedicated to Atari and I am not interested in producing magazines for other, lesser, computers but one of the problems of being an independent publisher with only one title is that you need to do more to cut out the inevitable wastage and make sure that the magazine is reaching the right outlets where it will sell and not lay on shelves unseen and unsold. Unlike others we don't have another title like Computerised Fish Breeder to fall back on (not that I would want to fall back on that!). Many readers have been reporting the progress of sales in their local area by passing comment but it is, in fact, beneficial to us if you can let us know of any major newsagents who either do not stock the magazine or who sell out. It is not possible, or indeed sensible, to get the magazine into every small newsagent but it is quite important to make sure that we know where the magazine is selling well so that we can ensure that our distributors get more copies to those outlets. If you find a shop that has sold out of PAGE 6, ask them how many copies they had and then drop us a line or give us a ring, it will help us and it will help you.

One of the benefits of getting the sales settled is that we can make decisions about whether to put extra pages in the magazine when needs be. For instance we had far too much material for this issue and would have liked to have put in an extra eight pages as a Christmas bonus but until our newsstand sales have settled down it would be foolish to gamble. So you see, if you keep us informed, we might be able to keep you even more informed about what interests us all, Atari computing.

YOU CAN WRITE FOR US

Regular readers will know that we occasionally put out pleas to readers for programs and articles to keep the quality of PAGE 6 up to scratch and somewhere in this issue you will find an 'advert' offering you money in exchange for programs! If you are new to PAGE 6 you might be interested to hear what sort of programs and articles we like. As far as programs go, we will consider any type of program that uses the Atari's unique abilities well be it a game, utility, business, application or whatever. If you find it interesting enough to write, then others may also find it interesting to type in and use. Articles likewise. If there is any subject to do with Atari that you think you know well and find very interesting, then write about it. We have always preferred our contributors to write 'from the heart' rather than be commissioned to write 1000 words on such-and-such as we believe that that is what gives PAGE 6 more depth than other magazines.

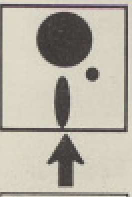
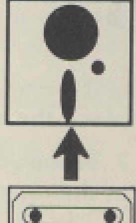
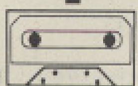
Don't be afraid to send a program or article to us. If we can't use it you will only get a rejection slip with a polite thank you for the submission, nothing more sinister! And we are quite happy to see stuff that other magazines have rejected because quite often they reject things simply because they don't know enough about Atari! Some of the best listings from past issues of PAGE 6 have been rejected by some of the 'top' magazines. It is often our, and your, good fortune that they seem not to understand just what a great computer an Atari really is!

HAPPY NEW YEAR

This one marks the passing of yet another year. To all our long standing and our many new readers PAGE 6 wishes a Happy Christmas and a fun-filled New Year. Let's hope Atari goes from strength to strength in 1988, they might even notice we're here.

I'm off on my first holiday of the year. See you in 1988!

Les Ellingham

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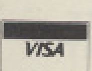
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How to Type in the Listings

and get them right!

The program listings in PAGE 6 are prepared carefully to ensure that they can be typed in as easily as possible. Before typing any listings ensure that you are familiar with the use of the Shift and CONTROL and INVERSE keys as outlined in your computer manual. The listings are prepared to match exactly what you see on screen. Every character that you may see in a listing is included in the chart below for cross reference. By using TYPO 3 you can ensure that you type in the programs EXACTLY as they are printed. Remember a single typing mistake may mean a program will not run.

WHAT ARE THOSE CODES?

Each line of a program begins with a special two letter code. THESE SHOULD NOT BE TYPED IN. They are used by the program TYPO to check that you have typed each line correctly. IF YOU HAVE NOT ALREADY TYPED IN THE TYPO 3 LISTING PLEASE DO SO NOW. The program can be used as you type in each line of a program or to check an already typed program. The code for each line will match but if you have problems check the listing conventions below carefully, you are most probably typing a CONTROL character incorrectly. TYPO 3 cannot check if a line has been missed so if you have problems in running a listing count the lines in the program and ensure none are missing. If the TYPO codes match and the program still does not run, LIST it to cassette or disk using LIST "C:" or LIST "D:filename", switch off the computer, re-boot and then ENTER the program using ENTER "C:" or ENTER "D:filename". Save this version in the normal way.

HOW TO USE TYPO 3

1. Type in the listing carefully for although you can use TYPO 3 to check itself (see 6 below) it may not work if you have made mistakes.

2. SAVE or CSAVE a copy of the program.

3. Each time you want to type in a program listing RUN TYPO 3 *first*. The program will install a machine code routine in memory and then delete itself. Now type in a line as shown in the magazine *excluding the first two letter code* and press RETURN.

4. A two letter code will appear at the top left of your screen. If this code matches the one in the magazine carry on and type the next line. Note, the code will not match if you use abbreviations. If you prefer to use abbreviations LIST the line you have just typed, move the cursor to that line and press RETURN. The code should now match.

5. If the code does not match, use the editing keys to correct the line and press RETURN again. Repeat if necessary until the codes match.

6. To check a line you have already typed LIST the line, place the cursor on that line and press RETURN.

7. When you have finished a listing just SAVE or CSAVE it in the normal way.

You can type in a program without using TYPO 3 and then check it by SAVEing or CSAVEing a copy of the program, running TYPO 3 and then LOADing or CLOADing your program and proceeding as in step 6 above.

Always SAVE or CSAVE a program before running it and always use TYPO before telling us that a program will not run.

```
EI 1 REM ********************************
AL 2 REM *  TYPO III by Alec Benson     *
         *         June 1985            *
SA 3 REM * A proofreader for ANTIC and  *
         *   PAGE 6 based on TYPO II    *
         * published by ANTIC magazine  *
EL 4 REM ********************************
SG 100 GRAPHICS 0
WG 110 FOR I=1536 TO 1791:READ A:CK=CK+A:
   POKE I,A:NEXT I
CG 120 IF CK<>30765 THEN ? "Error in DATA
    statements - Check Typing":END
YM 130 A=USR(1536)
VT 140 ? :? "TYPO III is up and running":
   NEW
MA 1000 DATA 104,160,0,185,26,3,201,69
HG 1010 DATA 240,8,200,200,200,192,36,208
QB 1020 DATA 242,96,200,169,79,153,26,3
RK 1030 DATA 200,169,6,153,26,3,162,0
RR 1040 DATA 189,0,228,157,79,6,232,224
TO 1050 DATA 15,208,245,169,93,141,83,6
KC 1060 DATA 169,6,141,84,6,173,4,228
EU 1070 DATA 105,0,141,95,6,173,5,228
BK 1080 DATA 105,0,141,96,6,169,0,162
KK 1090 DATA 3,149,203,202,16,251,96,0
ZR 1100 DATA 0,0,0,0,0,0,0,0
LD 1110 DATA 0,0,0,0,0,0,32,94
JM 1120 DATA 6,8,72,201,155,240,55,230
TV 1130 DATA 203,133,209,138,72,169,0,133
TW 1140 DATA 208,162,8,10,38,208,6,209
MF 1150 DATA 144,7,24,101,203,144,2,230
RL 1160 DATA 208,202,208,239,133,207,24,1
   65
TM 1170 DATA 204,101,207,133,204,165,205,
   101
AW 1180 DATA 208,133,205,165,206,105,0,13
   3
XH 1190 DATA 206,104,170,104,40,96,138,72
NR 1200 DATA 152,72,162,0,134,207,134,208
GF 1210 DATA 160,24,6,204,38,205,38,206
EA 1220 DATA 38,207,38,208,56,165,207,233
TM 1230 DATA 164,170,165,208,233,2,144,4
SK 1240 DATA 134,207,133,208,136,208,227,
   162
CB 1250 DATA 8,165,207,133,204,165,208,6
XN 1260 DATA 204,42,201,26,144,4,233,26
MB 1270 DATA 230,204,202,208,242,133,205,
   169
BC 1280 DATA 128,145,88,200,192,40,208,24
   9
WV 1290 DATA 165,204,105,160,160,3,145,88
QA 1300 DATA 165,205,24,105,161,200,145,8
   8
MQ 1310 DATA 32,69,6,104,168,76,153,6
```

Lower case	Inverse lower	Upper case or Shift	Inverse Upper or Shift	CTRL	Inverse CTRL
1		!			
2		"			
3		#			
4		$			
5		%			
6		&			
7		'			
8		@			
9		(			
0		)			
<					
>					
a		A			
b		B			
c		C			
d		D			

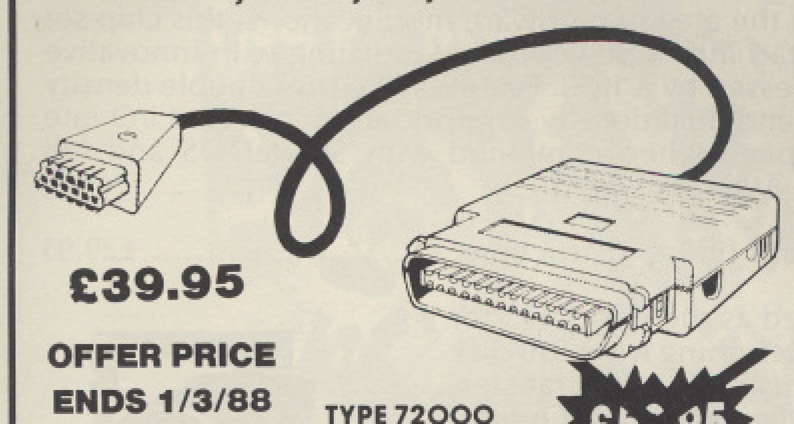
Lower case	Inverse lower	Upper case or Shift	Inverse Upper or Shift	CTRL	Inverse CTRL
e		E			
f		F			
g		G			
h		H			
i		I			
j		J			
k		K			
l		L			
m		M			
n		N			
o		O			
p		P			
q		Q			
r		R			
s		S			
t		T			

Lower case	Inverse lower	Upper case or Shift	Inverse Upper or Shift	CTRL	Inverse CTRL		
u		U					ESC ESC
v		V					ESC CTRL -
w		W					ESC CTRL =
x		X					ESC CTRL +
y		Y					ESC CTRL *
z		Z					ESC SHIFT CLEAR
-		_					ESC DELETE
=		|					ESC TAB
;		:					ESC SHIFT DELETE
+		\					ESC SHIFT INSERT
*		^					ESC CTRL TAB
,		[					ESC SHIFT TAB
.		]					ESC CTRL 2
/		?					ESC CTRL DELETE
							ESC CTRL INSERT

INVERSE SPACE

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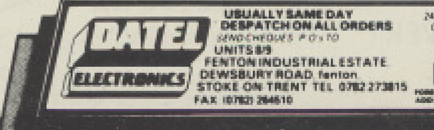
NLQ	FUTURE	DESCENDER
ABCDEFGH	ABCDEFGH	ABCDEFGH

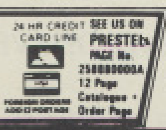
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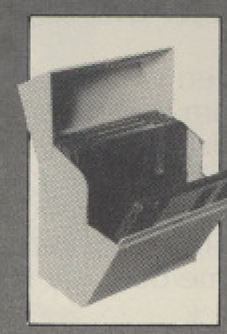




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BANNED!



Friday 13th turned out to be unlucky for Red Rat Software for on 13th November they launched Little Devil, their latest Atari release, only to discover that it had been banned by Silica Distribution and certain overseas distributors! What is more Silica went totally over the top and banned their next release entitled Nightmares even though they hadn't seen a finished version!

So what is so evil about these titles? Nothing at all, they are just variations on traditional arcade style games. Little Devil just happens to be set in Hades where you have to collect lost souls in order to rescue a Princess, and Nightmares has some superb monsters in a scrolling shoot-em-up format. So why ban them? Silica say that they will not touch anything that deals with the occult because it 'is harmful to children'. Talk about double standards! How come it is perfectly acceptable to kill people with karate, bombs and guns and wipe out every living alien just because they don't happen to come from your planet, yet rescuing a Princess in Hades is harmful? We suspect it has a little to do with distributors losing interest in 8-bit titles and finding a convenient excuse not to stock them. It will be interesting to see how many ST titles get banned (we can think of several candidates) in the coming months.

In the meantime, Red Rat need the support of every Atari 8-bit owner because they are one of the few to stick to supporting this format. In a difficult market they are trying to bring you new titles regularly and if they can't get them onto the market, you will lose another software company. If your local dealer can't get these titles you can order direct from Red Rat at P.O. Box 12, Prescot, Merseyside, L35 5HG. Tel. 051 426 9085. Both titles are £7.95 on cassette and £9.95 on disk.

Other new releases from Red Rat, (censorship allowing!), are SPACE WARS, DOUBLE PACK No. 1 with PLANET ATTACK and MADJAX, LEAPSTER, DOUBLE PACK No.2 with BURGLAR BILL and POTHOLE PANIC and SPEED RUN. All are £7.95 on cassette and £9.95 on disk. Two new releases for the ST at £14.95 are Pengy and Screaming Wings.

Support Red Rat, they are supporting you!

PCW RECORD

The computer industry is alive and well judging by the recent PCW Show. Anyone who went on the Saturday will testify how crowded it was, there were even rumours that they might have to shut off the gallery because of the number of people!

The official attendance figures show that over 72,000 visitors turned up making this the biggest U.K computer show in history. With repeat visits included, the attendance was over 80,000.

Getting that many into the Novotel will be a bit of a crush, but let's hope that the Atari Christmas Show, just gone, enjoys equal success.

GAME OF THE YEAR

The Guild of Thieves, available in Atari format, has been voted Game of the Year in the 1987 British Micro Computing Awards, a double achievement for Magnetic Scrolls following earlier awards for their first release, The Pawn.

Magnetic Scrolls Managing Director Anita Sinclair is delighted that their second game should win an award because "it was probably judged on the quality of gameplay ... rather than the technical achievements of the parser and the visual delights of our graphics". The Pawn was widely acclaimed as breaking new ground with its parser and graphics and following up an initial success is always difficult.

Rainbird Software have just released the third Magnetic Scrolls adventure, Jinxter, and are hoping that it will be just as successful.

GNOME RANGER

Level 9's latest release, Gnome Ranger is being marketed directly rather than through Rainbird Software and is a 3-part, light-hearted adventure concerning a bossy Gnome called Ingrid who leaves her dreary farming village to study gnome economics at college. She returns with all sorts of new-fangled ideas and sets about modernising her family whether they like it or not! Every improvement ends in disaster but Ingrid is not put off, she chronicles every event in a diary which accompanies the game. Eventually, after a secret meeting, the gnomes give Ingrid a magic scroll but when she reads it it transports her far away and she must find her way back, putting the wilderness to rights as she goes!

Level 9 have tried to make this a different style from their previous adventures whilst retaining the parser and text abilities found in Knight Orc, their latest release through Rainbird.

Unusually for Level 9 this one is available on disk for the Atari XL/XE at £9.95 or on 2 cassettes for the same price. It is good to see Level 9 finally recognising Atari owners with disk drives and doubly good that they can put the product out at the same price as on cassette. Why can't others do it?

EASIER THAN AUTOMAKE?

Dear PAGE 6,

While browsing through the September/October issue of PAGE 6, I was surprised to see your AUTOMAKE program for disks. I agree that it is a lot easier than typing RUN "D:filename" but I have found a much easier way, using DOS 2.5. First insert the DOS master disk and boot it up, when the DOS menu appears select 'L' to load a binary file. When the prompt appears, type SETUP.COM and press return. The drive will then load and run the program. A menu will appear, select option '3' SETUP AUTORUN FOR BOOT. Another menu will then appear, select option '2'. It will then ask you the name of the file you wish to Autorun. Type in the filename, for example D:PAGE then insert the disk that you want the Autorun on, (Remember it must have the program on e.g. PAGE), press return and it will now create the AUTORUN SYS file. To re-load switch off the computer and switch on again, it will now autorun your file

Michael Jaques,
Manchester

We are aware of the use of SETUP.COM but a lot of users do not have a full copy of DOS 2.5 which includes this utility and are you sure it's easier than using AUTOMAKE? It seems to us that typing RUN "D:AUTOMAKE" and then typing in your filename is easier for beginners than having to remember about Binary loads and such like.

OH NO! NOT DOS 4!

Dear PAGE 6

Help! I am one of those unfortunates that upgraded to DOS 4 and have since discovered that I would be far better off with DOS 2.5. Can anyone suggest a way of converting my files from DOS 4 to DOS 2.5? I don't own a cassette unit so I can't make the transition via tape. Please help!

Andrew J. Yates
Oswestry

And we thought everyone had started out with a tape deck! Sorry, but the only simple way of doing the conversion that we know of would be by means of CSAVEing the files and then CLOADing them into the DOS 2.5 format. Unless some other reader in the same situation has written a conversion program?

GAUNTLET BUGS!

Dear PAGE 6,

Like John Davison in his review in Issue 29, I have had similar problems when loading Disk 2 and when selecting a character.

The Dungeon disk appears to be heavily copy protected, and remembering an article on copy protection using non-standard sectors which indicates that some drives have problems reading these sectors, I reconfigured my drives to make the newer one Drive A. On re-booting, the dungeons loaded perfectly and there have been no problems with crashing when selecting a character. I also tried sending one character to Exit 4 and the other at Exit 8. There was no crash and the character at '8' waited patiently for the other to join him the long way.

The problems with crashing could therefore be related to the method of copyright protection used, a slightly below standard drive having trouble reading these non-standard sectors.

M.S. Silvester
Aldershot.

COPYING FASTER

Dear Sir,

I bought Vol.2 No.2 of the FASTER disk magazine at the PCW Show. Can the games and utilities be put onto another disk and if so how?

P.T. Whitley
Southampton

You may copy any of the FASTER disks, so long as it is for personal back up only, otherwise you will be in breach of copyright. Assuming that you have a single drive system, click and hold the left mouse button on the application you are going to copy, then drag it over on to the B: disk drive icon. From there follow the on screen prompts. It is quite simple but your must ensure that any associated files such as Resource files (with the extender .RSC) are also copied.

GOOD ADVICE!

Dear PAGE 6,

I would like to offer some advice to people having trouble with mail order companies. When writing to these companies, have the letter sent by recorded delivery. It costs around 40p for first class, but the company in question can't tell you it's been lost in the post. If this brings no joy, contact your local trading standards officer or consumer protection department. They should be able to make things move. Also keep a copy of any correspondence that is sent or received.

S.A. Collett
Kings Norton, Birmingham.

ASTRONOMERS UP IN ARMS!

Dear PAGE 6,

Why does there not seem to be any Atari astronomical software on the market? B.B.C., Crummydore and Spectrash have this type of software currently available but Atari seem to have omitted the possibility that people using an Atari have need of astronomical programs.

I cannot believe that Atari have neglected us amateur astronomers since Atari is big in the U.S.A and astronomy is a very popular pastime across the Atlantic.

I would be grateful for any help regarding the above.

Lynne Lancaster
Secretary
Blackpool & District
Astronomical Society

Several programs, although not commercial, come to mind. For the ST there is SKY MAP from the public domain. For the 8-bit there is Observational Astronomy from ANALOG's issue 13 or Skyscape from COMPUTE!, Issue 66. You might be able to get these back issues through the Contact column. Atari themselves have an astronomy program for the 8-bit although it seems to have only been released in the States. You could try a retailer such as Ladbroke Computing of Preston who specialise in importing software from the U.S.A. Maybe some of our American readers could suggest other programs?

Got anything interesting to talk about? Or some questions to ask? Or some tips to pass on? Write to Readers Write, PAGE 6, P.O. Box 54, Stafford ST16 1DR

WARGAMES

A major survey of almost every wargame available for the 8-bit Atari conducted by M. Evan Brooks

Computer wargaming in the United States is a dedicated market; there are c.15-20,000 dedicated computer wargamers, and this points out a problem inherent in the market. While wargame products are assured of a certain sales target, it is quite difficult for sales to reach the broader market. Only Microprose has been able to expand its sales into the gold or platinum levels (100,000/ 250,000 sales respectively), thus, as companies grow larger, they tend to produce less wargames and target the more mainstream efforts.

In the United States, computer trends went from arcade to adventure to simulations. In Britain, the trend went from arcade to simulations, but with the emphasis on cassette products in Britain, products tend to have a relatively short shelf-life and an inexpensive price. This has tended to prevent the more detailed simulations from gaining access to the overseas markets. Hopefully, this is in the process of change.

This reviewer has been engaged in simulation gaming since 1966, and has been involved in computer simulation gaming since 1982. My background includes service in the United States Army (currently, I hold a Reserve commission as an Infantry major).

ALMOST EVERY GAME AVAILABLE

This article will attempt to rate every wargame for the 8-bit Atari with which the author is familiar. Many of these game will be converted to the ST. In deciding upon the aspects of a computer wargame, there are certain selections that one must make. Usually, levels of difficulty range from **introductory** to **intermediate** to **advanced**, with gradations between these parameters. In addition, the primary medium must be considered: **land**, **sea** and/or **air** and finally, the level of the simulation – **tactical** (man-to-man up to company-level), **operational** (battalion-level to division-level) and **strategic** (corps-level to theatre army or higher). This review will delineate the games available by levels of difficulty. Within each level, the subject game will be characterised by its medium, simulation level and overall recommendation. Overall recommendations are noted by star ratings following the game title:

0 = avoid
★ = minimally adequate, at best
★★ = buy ONLY if interested in this period
★★★ = recommended
★★★★ = highly recommended
★★★★★ = a MUST HAVE
\+ = a rating midway between any of the above

These ratings are the author's own, and reflect a personal opinion as to the 'success' or lack thereof of the product. Additionally, it must be noted that price does bear a relation to rating, i.e. the 'bang for the buck' theory holds true, and often an inexpensive game can achieve a higher rating than a (marginally) better but more expensive product. Following each Level are the Moribund Products – no longer available for sale, but often found in close-outs and sales.

M. Evan Brooks is well qualified to comment on Wargame simulations being a graduate of the United States Army Command & General Staff College and being currently enrolled in the Naval War College. He has obtained qualifications in various branches of the Services including Infantry, Armor and Military Intelligence. His full time occupation is an Attorney with the Federal Government (IRS) and he is a Major in The United States Army Reserve currently serving as Operations and Planning Officer for a Military Police Battalion.

AVAILABILITY

SSI have an agreement with U.S. Gold in this country and most, but not all, of their titles are easily available from any Atari dealer or from many Mail Order dealers. Microprose now have a U.K. subsidiary and their games are, or will, be available at U.K. prices. Most of the other games, providing they are currently available in the United States, can be obtained from specialist dealers such as Strategic Plus, P.O. Box 8, Hampton, Middx TW12 3XA (Tel. 01 979 2987) and Computer Adventure World, 1A Charing Cross, Birkenhead L41 6EJ (Tel. 051 666 1132). Other retailers who specialise in import American titles may be able to help such as Ladbroke Computing, 3, Ormskirk Road, Preston, Lancs PR1 2QP (Tel. 0772 21474). Where products are released in the U.K. you will find the price in sterling alongside, otherwise the price in US$, where known, is shown.

INTRODUCTORY LEVEL

This is where you should begin if you have little previous wargaming experience. Jumping in at too high a level might put you off wargaming forever. Get a few of these, learn the ropes and you will soon be at intermediate level.

BATTALION COMMANDER ★★ *SSI, £14.99*
A tactical contemporary portrayal of armored warfare. With built-in as well as design-your-own scenarios, the game offers a myriad of options. Easy to play, its utility is damaged by its ahistorical lessons learned. LAND

BATTLES FOR MIDWAY 0 *TDC, $?*
This simulation offers outdated graphics, poor game play, and little value. Since it is a recent release, many Atari owners may be considering its acquisition due to the dearth of new products, but beware – this is not a viable commercial simulation, it resembles public domain material available elsewhere. SEA/AIR

BROADSIDES ★★★★★ *SSI, £24.99*
A tactical simulation of ship-to-ship combat during the Napoleonic Wars. With both an arcade and tactical option, one may add layers of difficulty at his own pace. Quick play times and ease of operation make this a necessity in any wargamer's library. Highest recommendation. SEA

COLONIAL CONQUEST ★★ + *SSI, £24.99*
A strategic/economic simulation of the Age of Imperialism. The manual is more difficult to comprehend than the game is to play. Multiple-player interaction is strongly recommended. A cross between the board games of *Risk* and *Diplomacy*. LAND/SEA/ECONOMIC

FIELD OF FIRE ★★ + *SSI, £14.99*
A tactical simulation of squad-level operations on the Western Front during World War II. Scenarios are varied and enjoyable however, this reviewer is not overly enthused about the historical accuracy and lessons learned from this simulation. Nevertheless, it is a good introduction to computer wargaming. LAND

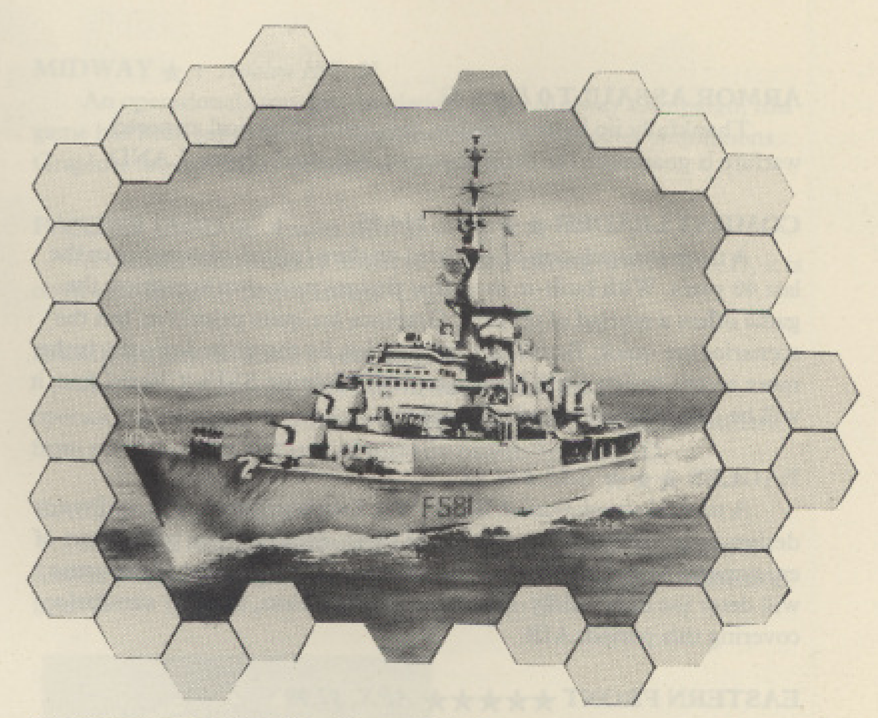
FIFTY MISSION CRUSH ★★ *SSI, $39.95*
A tactical recreation of the bomber offensive against Germany during World War II. Realistic but dull, with little room for player abilities. AIR

LORDS OF CONQUEST ★★★★ *Electronic Arts, $34.95*
A strategic/economic game of conquest. Relatively primitive graphics are coupled with a map maker and map options to make a very interesting multi-player game. As a solitaire effort, it is not quite as interesting, but still retains some appeal. Playability is a definite plus here. LAND/SEA

NAM ★★ *SSI, $39.95*
An operational simulation of battles in Vietnam, its easy play is marred by its complete ahistoricity vis-a-vis airmobile assault and gunship employment. Enjoyable as a 'shoot-em-up', but laughable as a conflict simulation. LAND/AIR

NAPOLEON AT WATERLOO ★★★ + *Krenteck, AT/C, $34.95*
An operational simulation of the most famous battle in history, this game has the potential to be great, however, execution leaves something to be desired; historical accuracy and valid lessons learned are a definite minus. LAND

OGRE ★★ + Origin, *£19.95*
A faithful recreation of the boardgame, this faithfulness can prove negative. The boardgame at $2.95 was a bargain; the computer game at $39.95 is not. Still, a good introduction to computer wargaming. LAND



PANZER GRENADIER ★★ + *SSI, £24.99*
A tactical simulation of armored warfare on the Eastern Front during World War II, its lessons learned are not overly accurate. Reconnaissance by fire is overemphasised, and opportunity fire is hit-and-miss. Overall, a solid game, but lacking panache. LAND

SARATOGA ★ Antic, *$19.95*
An Eastern Front clone, this operational/strategic simulation of the American Revolution in 1777 is destroyed by marketing technique. With documentation available on the disk flip side, the lack of a hard-copy map (specifically referred to in the documentation) makes the game almost unplayable. LAND

SIX GUN SHOOT-OUT ★★★ *SSI, $39.95*
A tactical man-to-man simulation covering famous Old West scenarios (both historical and Hollywood). Primitive graphics detract from this simulation, but it is quick and easy. Historically inaccurate, its quick playing time and enjoyment somewhat make up for its defects. LAND

TIGERS IN THE SNOW ★ + *SSI, £14.99*
An operational simulation of the Battle of the Bulge, its primitive graphics and play mechanics have been superseded by more recent efforts and limit its appeal. LAND

TOP GUNNER ★★★ *MicroProse, $24.95*
Three arcade games in a package; Hellcat Ace (World War II Pacific tactical air) and Mig Alley Ace (Korean War tactical air) offer an enjoyable interlude from true wargaming. Superseded by more recent products, the repackaging at the lower price still makes this an interesting offering. *(Note: these games are available separately in the U.K. at £9.95 on cassette and £14.95 on disk)* AIR

WARGAME CONSTRUCTION SET ★★ + *SSI, £19.99*
The source code from Roger Damon's previous designs (Operation Whirlwind/ Field of Fire/ Panzer Grenadier), the game's potential to design-your-own scenarios in history is limited by the failings of the system's mechanics. Still, a novice may well find its flexibility interesting. LAND

THE MORIBUND

Seek them out or not

AFTER PEARL ★★★ + *SuperWare, $19.95*
A strategic simulation of the War in the Pacific (1941-1945), this game bears little resemblance to history, however, it is fun and quick to play (c. 45 minutes for the campaign). Reminiscent of Avalon Hill's board game Victory in the Pacific, this is recommended for the novice. SEA/AIR

ARMOR ASSAULT 0 *Epyx, $?*

Thánkfully no loner available, this game of tactical armored warfare is guaranteed to deter the most dedicated player. LAND

COMBAT LEADER ★★ *SSI, $14.95*

A tactical simulation of armored warfare (squad/platoon) over the last 40 years. With built-in as well as design-your-own scenarios, the game offers a myriad of options. Graphics are quite primitive, but the scenarios are quick. Battalion Commander, by the same designer, is the more recent design (with better graphics). Joining SSI's 'Classic' line, it will be discontinued shortly. LAND

EAGLES ★★★ *SSI, $14.95*

A tactical simulation of World War I aerial combat. The ability to design-your-own scenarios as well as those already extant offer hours of enjoyment, however realism is very low and the slow pace of the game will deter the only mildly-interested. Nevertheless, the only simulation covering this period. AIR

EASTERN FRONT ★★★★★ *APX, $2.98*

An operational/strategic simulation of the German invasion of Russia during World War II. The cartridge version offers both beginner and advanced scenarios. Obsolete by contemporary programming standards, it is still fun to play and a bargain at the price (assuming that one can still find it!!). LAND

FLYING TIGER 0 *Discovery, $?*

A tactical air-to-air simulation of World War II (Pacific Theatre). The graphics, realism and play value are sufficient to deter anyone from further play. AIR

JAGDSTAFFEL 0 *Discovery, $?*

A tactical game similar to Flying Tigers, only occurring in the European Theatre of Operations. Just as bad as Flying Tigers. AIR

LEGIONNAIRE ★+ *Avalon Hill, $19.95*

A tactical(?) simulation of warfare by the Roman legions against various barbarian tribes. Quickly learned and playable in a single sitting, it bears obvious resemblance to its more successful ancestor Eastern Front. A good introduction to computer wargaming, as it combines aspects of arcade play and wargame play. LAND

OPERATION WHIRLWIND ★★+ *Broderbund, $?*

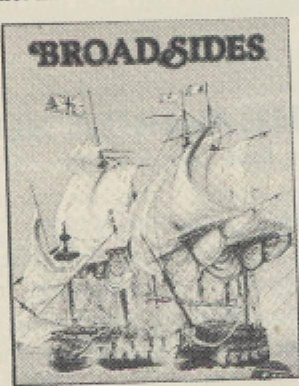
The ancestor of Field of Fire/PanzerGrenadier/Wargame Construction Set, this tactical simulation offers an urban assault during World War II. In many ways, it is more interesting than its descendants, but it is difficult to find. LAND

SHILOH ★★ *SSI, $14.95*

This operational recreation of the Civil War battle has been superseded by the computer wargame 'state of the art'. Easy to learn and play, it is not so much a historical study as a 'beer and pretzels' game. Fun for the novice even with its primitive graphics. LAND

WORLD WAR III 0 *Crystal, $?*

An operational simulation of conflict in the Middle East involving American and Soviet forces. Primitive, obsolete and inadequate, it is no longer available for sale. LAND



INTERMEDIATE LEVEL

Now that you have got into wargaming it's time to seek out more challenges. Some of these will tax you to the full but if you find them too easy, there is always the Advanced Level to come!

BORODINO ★★★+ *Krentek, $59.95*

Napoleon's tactical victory but strategic defeat in Russia, 1812. A set-piece battle, the simulation is historically accurate and enjoyable. Premiering on the 8-bit Atari in August 1987, this is one of the few 8-bit releases in recent memory. LAND

CLASH OF WILLS ★★ *DKG, $34.95*

A strategic simulation of war in Europe during World War II (both Eastern and Western Fronts). Primitive graphics and poor user interface coupled with extremely poor documentation will deter most players. Yet, the sheer scope of the simulation offers some playability and enjoyment. LAND/AIR

CONFLICT IN VIETNAM ★★★★ *MicroProse, £14.95 (C), £19.95 (D)*

An operational simulation of battles in Vietnam 1954-75. Historically accurate, it teaches more than one would expect; its basic problem is that operational warfare in Vietnam was rarely decisive, and for the gamer looking for clear-cut resolutions, this simulation may raise more questions than it answers. Recommended for those wishing to learn as opposed to those looking for sheer 'playing' fun. LAND/AIR

COSMIC BALANCE I ★★+ *SSI, $34.95*

Space opera, Cosmic Balance I is a tactical simulation of space combat a la Star Trek. Input is via keyboard, and graphics are primitive. Somewhat dated by later efforts, cf. Star Fleet I. SPACE

CRUSADE IN EUROPE ★★★★+ *MicroProse, £14.95 (C), £19.95 (D)*

An operational/strategic simulation of the Western Front during World War II, the scenarios offer more value for the money than most other games. The campaign suffers from a certain lack due to the artificial intelligence, but for the intermediate player, its mechanics and play give this game a high recommendation. LAND/AIR

DAM BUSTERS ★★ *Accolade, $34.95*

An arcade recreation of the bombing of the Ruhr dams a la '633 Squadron', this product's graphics and 'feel' make it too much of a game and not enough of a simulation. AIR

DECISION IN THE DESERT ★★★★+ *MicroProse, £14.95(C), £19.95 (D)*

An operational study of the Desert Campaign in World War II, it offers a fascinating study which will teach the intermediate player true aspects of armor desert warfare. While more accurate than Crusade in Europe, its scope is much less broad, thereby delivering less 'bang for the buck'. Still highly recommended. LAND/AIR

F-15 STRIKE EAGLE ★★★★+ *MicroProse, £9.95 (C), £14.95 (D)*

Is it an arcade game or a wargame? No matter what the decision, it has gone platinum (over 250,000 unit copies sold). Quick to play, multi-scenarioed and user-friendly; recommended. AIR

GREAT WAR 1914 ★+ *DKG, $39.95*

An operational simulation of the opening months of World War I (both Eastern and Western Fronts). It suffers from the same flaws as CLASH OF WILLS and does not have as much depth as its predecessor. LAND

KNIGHTS OF THE DESERT ★★ *SSI, £14.99*
An operational simulation of Rommel's Desert Campaigns in North Africa during World War II, it was the first SSI product to offer multiple stacking in the same hex. The concept was a failure; slow and ponderous, its recreation of the African Campaign does not deliver its potential. LAND

NORMANDY, BATTLE FOR ★★★ + *SSI, £14.99*
An operational simulation of the Normandy invasion, this game is moderately easy to learn (although the documentation covering the actual landings leaves much to be desired). A real player, it suffers somewhat from lack of joystick input. But overall, a solid intermediate level game. LAND/AIR

NATO COMMANDER ★★★ *MicroProse, £9.95 (C), £14.95 (D)*
An operational/strategic simulation of the next war in Europe, this reviewer is more fond of the game than the designers currently are. While the mechanics are relatively easy to learn, playability in the larger scenarios is limited. Still recommended overall. LAND/AIR

ROME AND THE BARBARIANS ★★★ *Krenteck, $34.95*
A strategic simulation of the Fall of Rome. Easy game mechanics coupled with difficult strategic decisions make this a real player. Still, the game system itself appears too tactical for such an ambitious strategic simulation. Recommended for the aficionado. LAND

SILENT SERVICE ★★★★★ *MicroProse, £9.95 (C), £14.95 (D)*
A tactical simulation of submarine warfare in the South Pacific during World War II. Superb graphics coupled with detailed rules, historical accuracy and layers of complexity make this simulation a necessity in every gamer's library. Why wait? If you don't have it, you should! SEA

STAR FLEET I ★★★★ *Cygnus, $49.95*
This tactical space simulation is a worthy descendant of the early mainframe StarTrek games. The multitude of options and ease of play make this an enjoyable product, although it can prove repetitious. Despite some reviewers considering this a rip-off from public domain products, this reviewer still recommends it. SPACE

SURRENDER AT STALINGRAD ★ + *DKG, $34.95*
The World War II Southern Offensive in the East carried on in DKG's inimitable format, i.e. primitive graphics, inadequate user interface and overall slowness of execution. LAND

THE MORIBUND

One to seek out – forget the rest

CLEAR FOR ACTION + *Avalon Hill, $34.95*
A ship-to-ship simulation a la BROADSIDES. However, this simulation is broader in scope and allows for multiple ship actions. With potential for greatness, its execution dooms it; primitive graphics coupled with horrendous user interface make this simulation barely marginal. SEA

COSMIC BALANCE II ★★ + *SSI, $34.95*
Cosmic Balance II offers a strategic expansion of the Cosmic Universe through emphasis on economic expansion. Somewhat dated by later efforts, cf. Imperium Galactum and Reach for the Stars. SPACE

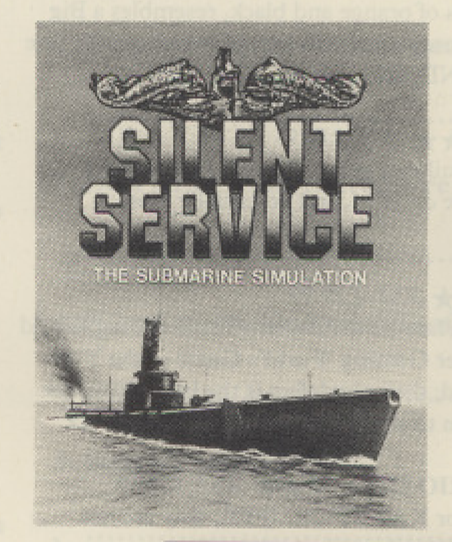
EXCALIBUR ★★★★ *APX, $?*
A strategic simulation of Arthur's attempt to forge a kingdom out of the British Isles. While introductory in play mechanics, the sheer scope of the game raises its complexity level to that of intermediate. This is not intended as a criticism; the game is a wargame by default – economic ramifications are the heart of this fine simulation. Rarely available for sale, it remains a fine game and a worthy addition to one's library. LAND/ECONOMIC

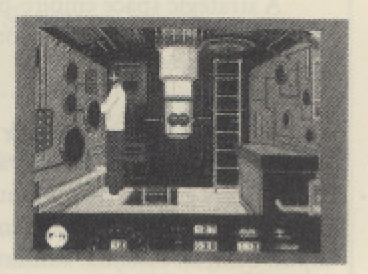
MIDWAY ★ + *Avalon Hill, $?*
An operational/strategic simulation of the Midway Campaign, this game has been superseded by improvements in computer simulations. Graphics are extremely primitive. SEA/AIR

PANZER JAGD ★ *Avalon Hill, $?*
A tactical simulation of armored warfare during World War II, it is obviously dated by newer efforts. LAND

PARIS IN DANGER 0 + *Avalon Hill, $?*
An early game superseded by newer efforts, this operational/strategic simulation of Napoleon's 1814 Campaign suffers from poor graphics and lack of solitaire playability. LAND

T.A.C. ★ *Avalon Hill, $?*
A tactical simulation of armored warfare during World War II. Similar to PANZER JAGD, it suffers from development obsolescence. LAND





ADVANCED LEVEL

This is where it all leads! You need to be experienced, dedicated or masochistic to try out some of these. You also need to have more money, for now you are hooked, the prices seem to go up considerably!

ANTIETAM, BATTLE OF ★★★ *SSI, £29.99*
An operational simulation of the bloodiest day in American history, this simulation is historically accurate, although not as interesting as GETTYSBURG. Layers of complexity from basic to advanced offer many options. The basic problem with the simulation is the battle itself – the North outnumbered the South almost 3-2, and since the player is aware of this, a World War I-type bloodbath occurs. In the solitaire option, the player as the Confederate would prove more interesting. LAND

BATTLE CRUISER ★★★ + *SSI, $59.95*
A simulation covering surface naval actions in both World Wars, this is a clone of the earlier released Warship. No new ground is broken, although this is the better bargain given its more extensive coverage. SEA

CARRIER FORCE ★★★ *SSI, $59.95*
A tactical/operational simulation of the major Pacific carrier battles of World War II, this game is extremely slow in execution and its historical accuracy may be questioned in some areas. Despite these flaws, it covers its subject in an interesting way and is worth the effort for anyone desirous of learning about the period. SEA/AIR

CHICAMAUGA ★ + *GDW, $49.95*
A tactical/operational study of the Battle of Chicamauga, this game offers a plethora of detail, however, its graphics are so primitive that they doom the game before it gets started. One has come to expect more in graphics than this game can begin to deliver! LAND

COMPUTER AMBUSH ★★★+ *SSI, £29.99*
A tactical man-to-man simulation of patrolling in World War II. The graphics are primitive, but the details make up for this deficiency to a large extent. LAND

GETTYSBURG: THE TIDE TURNS ★★★★+ *SSI, £29.99*
Similar to ANTIETAM, this tactical/operational simulation of the most famous battle in American history is more successful. Tense and complex, it is a fascinating game and a worthy addition to any gamer with the least interest in the American Civil War. Players should choose to begin on the second day for a more familiar simulation; the campaign scenario will generally result in positions other than historical, but it is interesting to see the might-have-beens. Highly recommended. LAND

GULF STRIKE ★+ *Avalon Hill, $29.95*
An operational simulation of contemporary combat in southwest Asia (CENTCOM). Detail and historical complexities plus orders of battle abound. But the graphics are enough to deter all but the most determined. The map, in shades of orange and black, resembles a Big Mac run amok or a sick Princetonian. An unworthy conversion of a fine Mark Herman boardgame. LAND/SEA/AIR

IMPERIUM GALACTUM ★★ *SSI, $39.95*
A strategic space empire-building game, this is a successor to COSMIC BALANCE II. More detailed, and potentially more interesting. SPACE

KAMPFGRUPPE ★★★★★ *SSI, £29.99*
A tactical simulation of warfare on the Eastern Front during World War II, this game was Computer Gaming World's Game of the Year (1985). Multiple options abound; the only defect is the lack of joystick input. Still, an essential addition to any wargamer's library. LAND

KAMPFGRUPPE SCENARIO DISK 1 ★★ *SSI, $21.95*
Five additional scenarios for KAMPFGRUPPE; they are not really necessary. Historical accuracy is subject to question in some of the scenarios, and the basic game itself can recreate any options the player wishes. LAND

MECH BRIGADE ★★★ *SSI, £29.99*
KAMPFGRUPPE in modern warfare on the Central Front. While the game bears an obvious resemblance to its predecessor, the effects of ATGMs and hull-defilade firing positions raise questions as to its accuracy. A welcome addition is the inclusion of smoke as an obscuring force. LAND/AIR

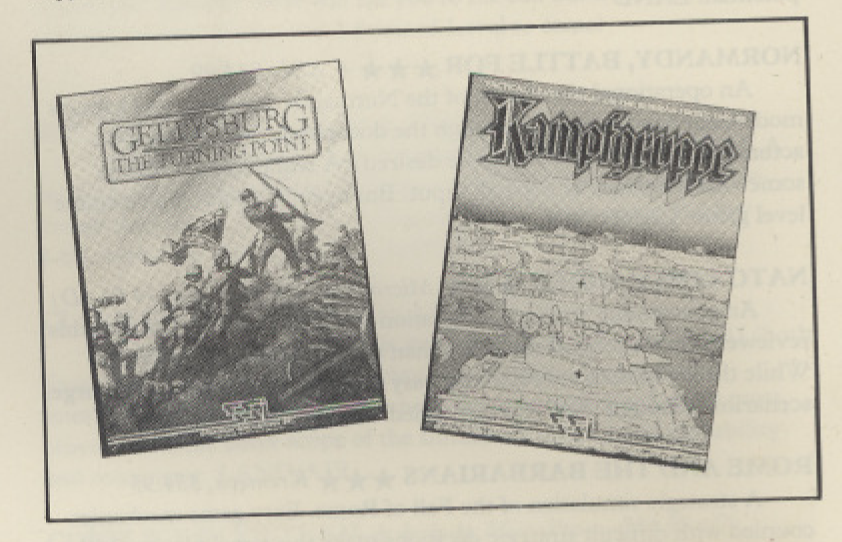
OPERATION MARKET-GARDEN ★★ *SSI, $49.95*
A tactical/operational simulation of the World War II airborne operation ('Monty's Folly'), this game suffers from poor graphics; determining the road network is a lesson in frustration. Also, moves may not be adjusted in mid-play, and overall, the clumsy and unforgiving user interface dooms this simulation. LAND

RAILS WEST ★★★+ *SSI, $39.95*
A strategic simulation of railroad expansion in the United States during the 19th Century, this is not a wargame per se, however, its economic 'warfare' and educational value make it a fascinating product. ECONOMIC/LAND

REBEL CHARGE AT CHICKAMAUGA ★★★★ *SSI, $59.95*
A very playable simulation of the Civil War Battle of Chickamauga, this product brings out the difficulties of the confused conflict in the densely wooded terrain. LAND

ROMMEL: BATTLES FOR TOBRUK ★+ *GDW, $34.95*
Similar to CHICAMAUGA, this tactical/operational simulation of World War II desert battles suffers from the same defects. Detailed and complex, the graphics and slow execution doom it as a playable simulation. The supply and air rules are the most complex yet seen in a computer simulation, but sheer unplayability and ennui will deter most players. LAND/AIR

U.S.A.A.F. ★★★★+ *SSI, £29.99*
An operational/strategic simulation of the Bomber Offensive over Germany (1943-1945) on a daily basis. Scenarios range from one month to two years. With German production and industrial devastation the key, it is a fascinating product. Highly recommended. AIR



WAR IN RUSSIA ★★★★★ *SSI, £29.99*
An operational/strategic simulation of the entire Eastern Front (1941-1945), this game is easily learned and played. Sheer size presents the difficulty; despite its size and problems with the artificial intelligence in the later stages of the war, this is an essential addition to the serious wargamer's library. Several other companies are planning Eastern Front detailed simulations, and they may well detract from War in Russia's appeal, however, it is currently the only Atari product with such depth. LAND

WARSHIP ★★★ *SSI, £29.99*
A tactical simulation of Pacific surface naval engagements (World War II). The play and documentation seem to gloss over much-needed details as to what is (or should be) happening, and therefore the game's main appeal is to true naval aficionados and not to those with a marginal interest. SEA

THE MORIBUND

The final three

ARDENNES, BREAKTHROUGH IN THE ★★ *SSI, $14.95*
An operational simulation of the Battle of the Bulge, this game suffers from poor graphics; determining the road network is a lesson in frustration. Also, moves may not be adjusted in mid-play, and overall, the clumsy user interface dooms this simulation. LAND

OBJECTIVE: KURSK ★★+ *SSI, $39.95*
A tactical/operational simulation of the largest tank battle in history. Extremely detailed, although user input is via keyboard and somewhat tedious. Overall, somewhat bland as a result of the game system utilized. LAND

REFORGER '88 ★★+ *SSI, $59.95*
A tactical/operational simulation of the next war in Europe. More complex than NATO COMMANDER, but suffering from the same defects as OBJECTIVE: KURSK!. Both games utilize the same game system and seem to lack a game 'soul', although this game is somewhat the more successful. LAND/AIR

That's it. One of the most comprehensive surveys of wargames for the Atari ever published. There are certainly a few missed out, particularly those released by British companies. We would be glad to hear from any dedicated wargaming reader with an update in similar style which includes all U.K. games for publication in a future issue. ●

THE PAGE 6 AWARDS 1987



YOUR CHANCE TO VOTE!

Here's a Winner!

Long time readers will know that we usually hold a Readers Poll at this time of the year to discover the best articles and programs from PAGE 6 in various categories, but with a lot of new readers for the most recent issues we felt it wouldn't be quite fair on contributors to earlier issues. Our wider readership does, however give us the opportunity to open up the Poll and find out what was the most popular software for the Atari in 1987 and so the PAGE 6 AWARDS, which will also include PAGE 6 contributions, is born. We will present an award to various people in the categories shown below based on what YOU decide. There can be no better reward for any company or person than to know that the Atari supporting public at large has recognised their efforts.

So get your thinking cap on and fill in the voting form. You may not be able to vote in every category but you can vote in at least one or two, so do it! We want at least one or two, so do it! We want thousands of votes so as an added incentive we will draw three entries out of the hat on 25th February 1988 and send the lucky winners software vouchers worth £25.

Photocopy this page or write your votes on a sheet of paper headed PAGE 6 AWARDS (you can even commit the ultimate sacrilege and tear the page out!) and send it to us by 25th February 1988. And if you want the chance of one of those £25 software vouchers, don't forget to include your name and address.

THE CATEGORIES

1. Best article/program in PAGE 6 for 1987

....

2. Best Atari 8-bit Arcade game

....

3. Best Atari 8-bit Adventure/Strategy game

....

4. Best Atari 8-bit Serious software

....

5. Best ST game

....

6. Best ST Serious software

....

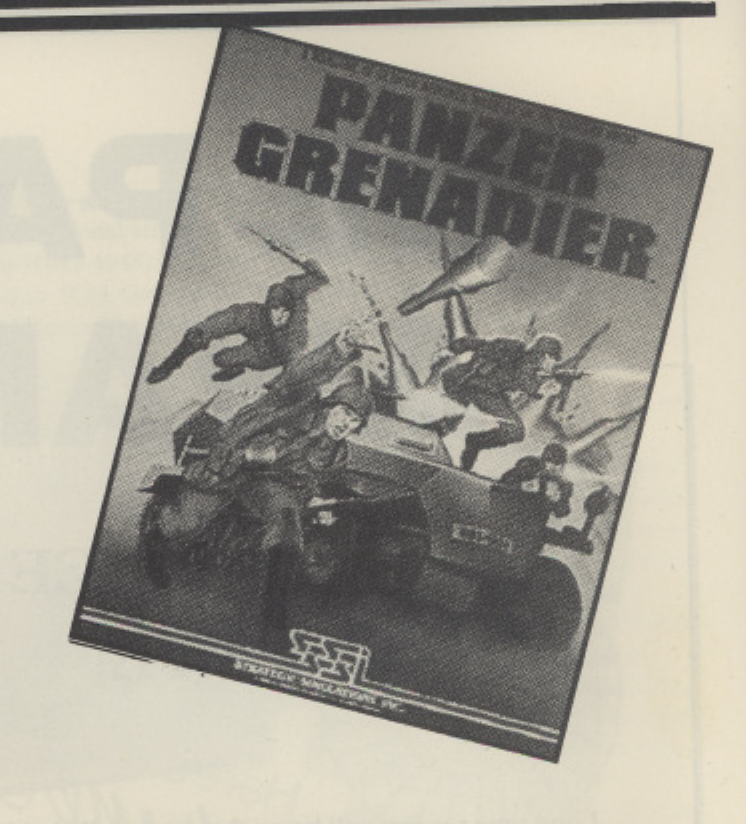
7. Company/person to have done the most to support Atari in 1987

....

8. Company/person to have done the *least* to support Atari in 1987

....

SSI



the Ultimate wargaming and fantasy company

There are several companies that have produced wargames and simulations for the Atari but perhaps the best known is SSI whose products have always been held in the highest regard. Prior to their recent agreement with U.S. Gold there was a flourishing trade in importing SSI simulations with dedicated wargamers thinking nothing of paying £70 or so for a top-class product such as War in Russia! So how does a Company such as SSI gain this sort of reputation and support?

START WHEN YOU ARE SEVEN!

SSI started out in 1979 with Computer Bismarck which was one of the first computer games to provide 'support materials' such as movement charts and grease pencils and quality packaging which was copied by many others and still remains a hallmark of SSI products. The company was founded by Joel Billings, an experienced board game player who gained a huge following at war gaming tournaments where he often played in three divisions simultaneously, managing to win all three! He began gaming at the age of seven when he became fascinated with the challenge and realism of strategy board games. After his school education he had to decide whether to go to graduate college but opted instead for writing computer games and so Computer Bismarck was born on a borrowed computer.

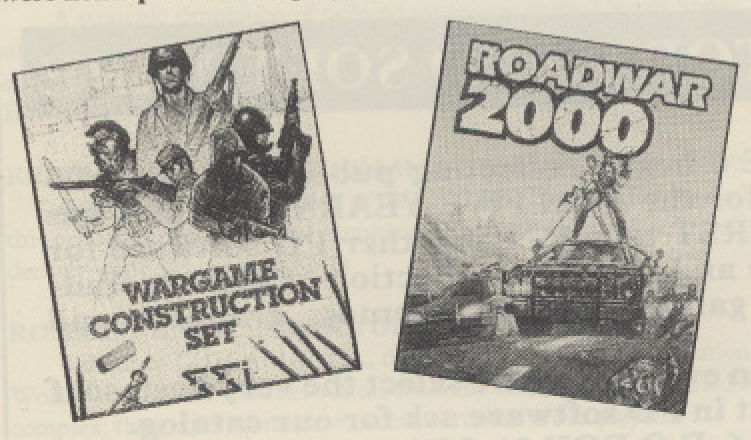
Joel wanted to use the power of computers to enhance the board games by providing animation, quick response and challenging opponents for solo play. It seemed that none of the established companies was interested in this use of the home computer so, based upon a few surveys of the likely market, he borrowed $1000 and founded SSI. At the time many 'first' computer programs, such as those put out by Scott Adams, were home produced in polythene bags with crudely typed labels but Joel felt he was competing against an established board game market and so invested in an innovative four colour bookshelf-sized box, with contents to enhance the software – packaging which has since become an industry standard for this type of game.

Like many youngsters starting in business, the family helped out and SSI, despite having an estimated turnover for 1987 of $5 million, still retains close family connections. Joel's sister Susan is the company's operations executive and his mother Leona writes many of the instruction books and has even learned to program herself. Father Robert, a professor of English, writes many of the colourful background stories found in SSI rule books. The company is now quite sizeable with several more board members and 32 staff. It's continued growth over the past six years has meant moving four times before settling in a 12,000 square foot facility in Mountain View, California.

BEYOND WARGAMES

Although they started with wargames, and have produced many of the 'classics' to be found in M. Evan Brooks' survey of war games in this issue, SSI now has a broad range of products including Fantasy Adventures and Sports simulations. Many of their titles such as Questron, Wizards Crown and Roadwar 2000 are well-known to Atari users and several have won awards. Roadwar 2000, reviewed in this issue, was voted as 'Best Strategy/War Game of 1986' by a leading American magazine and Gettysburg and Wizards Crown have also recently been awarded similar titles. In all SSI have produced 75 different titles and currently market over 60 programs in 200 different versions.

Never a company to stand still, SSI target over 50 new games a year, including conversions, and uses a strong team of internal and external developers to produce their titles. Despite this output they regard quality as paramount and this has led them to an agreement with TSR which promises to be the most exciting event of 1988 for anyone interested in computer adventuring and simulations.



by Les Ellingham



Keeping SSI busy for the next five years!

DUNGEONS & DRAGONS

Earlier this year SSI entered a competition with several other companies in a bid to become the publisher of computer games based on the phenomenally successful Advanced Dungeons & Dragons games developed by TSR. The official Dungeons & Dragons has an enormous worldwide following and any company that could produce computer games with TSR's blessing would be sure to have a very successful 1988 and beyond!

Obviously many companies wanted Dungeons & Dragons so TSR set some very high standards and invited interested companies to prove to them why they should have the privilege. SSI already had a quality background and were able to better their competitors and so win the licensing agreement which will last at least five years. SSI will produce a a series of role-playing adventures and, as a result of their marketing agreement with U.S. Gold in this country, the latter will produce five multi-player arcade style adventures all of which will be marketed worldwide. SSI will also be producing Dungeonmaster/ Player Aid disks to assist players of the conventional board games.

It won't be an easy task, for TSR will vet every step to ensure that the products are of the highest quality but SSI, with their past product history, should have no problems.

A WHOLE NEW WORLD

The scope for the Fantasy Adventure simulations is enormous as TSR have created a whole new fantasy world in which the computer simulations will be based. Entitled Forgotten Realms, it will be supported with conventional Dungeons & Dragons board games, novels and calendars the first of which have already been produced. SSI's first fantasy adventure will be set in the mountains of the Forgotten Realms which take up about 27 square inches of a map measuring some 24 square feet! If they get the first one right, and there is no reason to think that they won't, there is likely to be a lot of adventuring coming your way in the next five years!

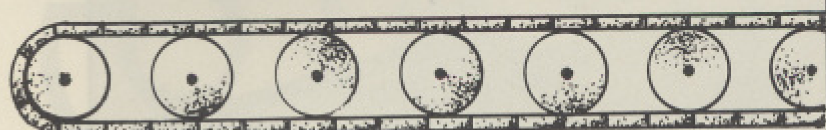
MORE WARGAMES

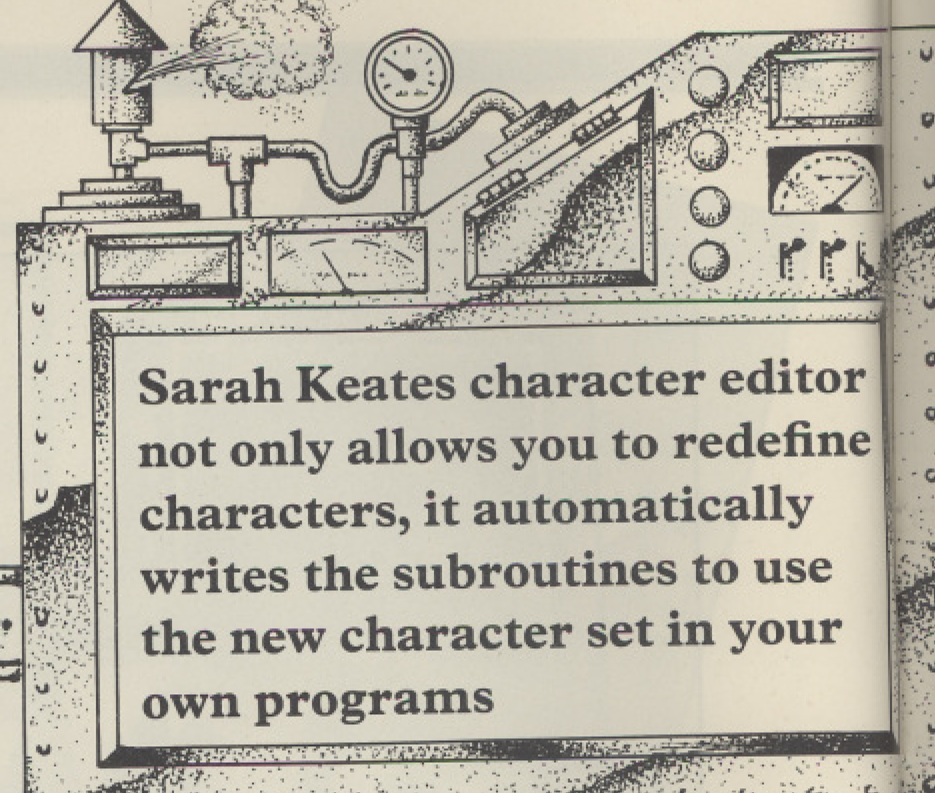
If SSI's wargaming followers are worried that they won't get a look in, they needn't be for SSI promise that the work on the Adventure games will be carried over into a continuing series of wargames that will feature enhanced graphics. In the pipeline are several games from the guys who produced Gettysburg including one on the Civil War battle of Shiloh and another on Napoleon's battles in Europe. From other authors there will be a platoon level World War II game and a simulation of the conflict in Afghanistan is also in the works.

A STORY OF SUCCESS

SSI then, developed from a young man's fascination and enthusiasm for board games into a major $5 million turnover computer company that has just won the biggest licensing deal in the computer industry. Having the right product at the right time obviously had a lot to do with it in the early years but the real story of success is in continually producing software of the highest quality, well researched and well packaged and which does not date. Computer users will be playing wargames and fantasy adventures long after the initial fascination of arcade games dies away and that is what Joel Billings recognised way back in 1979. ●

The FONT FACTORY





Many readers will know that it is possible to change the character set on the Atari in BASIC and almost everybody has seen a changed character set for it is a technique used in many commercial games. There have been several character designers published in the past but most of them save only the DATA for the revised set of characters ad leave the user to devise his or her own way of using the new character set. Now Font Factory will allow even those with the minimum of programming knowledge to generate and use their own characters sets. Font Factory will write the necessary subroutines for you! All you will need to do is ENTER the subroutine created into your own program and place an appropriate at the start of the program. It is even possible for you to load existing character sets such as those on the PAGE 6 issue disks and save them for use in your own programs.

The Font Factory is a flexible and powerful character editor. Fonts can be saved on disk or cassette either directly or in the form of Basic DATA statements. It can even generate a subroutine to install your custom sets into your own programs. The Font Factory runs on any 8-bit Atari with at least 32K of memory and a disk drive or cassette deck.

GETTING STARTED

Typing in The Font Factory is straightforward if you use TYPO 3, just type it in and SAVE it to disk or CSAVE to cassette. RUN the program and when the program has initialised, the main editing screen will be displayed. In the top part of the screen is a window showing the entire character set. In the middle of the screen is a menu of the available editing commands and the editing grid. On the grid, an enlarged view of the character currently being edited is displayed. Beneath the grid, the internal and ATASCII codes for the character are shown.

There is not room here for a full discussion on the theory of character definition but basically any point plotted in the 8 × 8 matrix used for each character will be shown as part of the character and any point not plotted will be shown as blank. If you do not understand the theory fully, just RUN the program and experiment by making some changes to a character and then storing it. You will see the results on screen and will soon get the hang of it.

We are proud to present Font Factory, not only because it is a good program but because its author, Sarah Keates, is just 14 years of age. Sarah lives in Belgium. The presentation of her program and article was one of the most professional we have ever had and puts many others to shame! Where are the other ladies, then? And how about some of the young (and not so young!) lads seeing if they submit programs equally as good.

EDITING COMMANDS

The commands available are shown on screen at all times but for reference and greater explanation are as follows.

+ – * = – Moves the cursor around the grid (there is no need to use CONTROL).

Space Bar – Draws or deletes a point on the grid.

C – Clears or fills the grid. If the program is in DRAW mode, then the grid will be filled in, if in delete mode, the grid will be emptied.

R – Restores the character being edited to the ROM character.

S – Stores the contents of the grid. The character set window will be updated to show the new character.

N – Selects a new character to be edited. If the program is in CHARACTER input mode, type the character you wish to edit and press RETURN. If the program is in ASCII input mode, enter the ATASCII code of the character. NB: some characters cannot be entered in CHARACTER mode, for example Space (ATASCII 32).

< – Selects the preceding character in the set to be edited. If the program reaches the beginning of the set, it will wrap around to the end of the set.

> – Selects the next character in the set to be edited. If the program reaches the end of the set, it will wrap around to the beginning of the set.

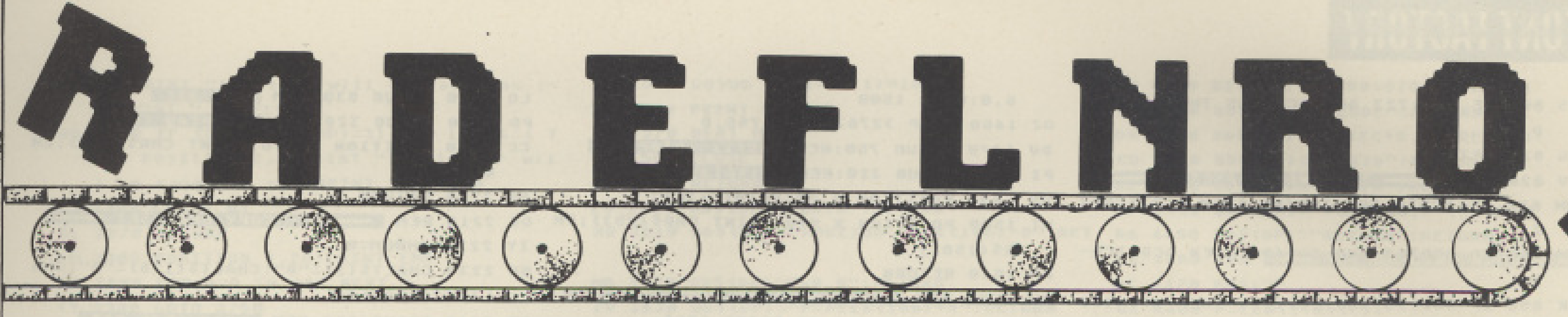
D – Toggles between DRAW and DELETE mode. The current selection is highlighted on the menu.

A – Toggles between CHARACTER and ATASCII input mode. The current selection is highlighted on the menu.

E – Exits the program. This command leaves the user's character set intact.

M – Restores the ROM character set.

Shift I – Displays the SAVE/LOAD menu. The character being edited should be stored before using this command.



SAVING AND LOADING

As stated, Shift-I will display the sub-menu for saving or loading character sets. This has 8 options which are as follows.

Option 1 – Saves the entire character set to disk or cassette with extension '.FNT'.

Option 2 – Saves the entire character set to disk or cassette as BASIC DATA statements. The file will be in LISTed format with the extension '.LST'.

Option 3 – Saves all characters which have been altered directly to disk or cassette with the extension '.FNT'.

Option 4 – Saves all characters which have been altered as Basic DATA statements with the extension '.LST'.

Option 5 – Loads the entire character set from disk or cassette.

Option 6 – Loads a partial character set from disk or cassette.

Option 7 – Lists the directory of drive 1.

Option 8 – Returns to the main editing screen.

A few notes are useful regarding the options. Firstly, the Font Factory includes a routine to validate filenames. It will not allow you to enter filenames that are too long or contain illegal characters. Font Factory filenames do not need extensions as these are automatically added by the program. If you do enter an extension, the program will overwrite it. There are two ways of entering filenames:

1. Just a filename. The program will add the default device specifier ("D:") and the correct extension.
2. Device specifier:filename. The program will use the device specified (if it is valid) and add the correct extension.

Whenever you save a character set, you will be given the option of generating a subroutine to load the set. If the set is saved as Basic DATA statements using options 2 or 4, the loader will be included with the DATA statements, and the program will have the extension of '.LST'. This may be added to any program of your own by ENTERing it and then resaving the entire program. If the set is saved directly to disk or cassette with options 1 or 3, the set will be saved with the extension '.FNT'. and the loader will be saved as a separate file in LISTed format with the extension '.LST'. This subroutine will read the character set from disk or cassette but the DATA will not form part of your program.

It should be noted that if you have saved a partial character set only, the loader will only load the characters which you have altered. The rest of the set will be blank unless you copy the ROM set first into the appropriate part of RAM.

Font Factory really is very easy to use even with a limited amount of programming knowledge. Give it a try, you will be able to give a new look to many of your programs.

```
LU 100 REM ********************************
MW 110 REM *      THE FONT FACTORY        *
FS 120 REM *            by                *
MW 130 REM *        Sarah Keates          *
IT 140 REM * ---------------------------- *
CD 150 REM * PAGE 6 MAGAZINE - ENGLAND *
MG 160 REM ********************************
RA 170 REM
RC 180 REM
ST 260 GRAPHICS 0
FW 270 GOSUB 5100:REM initialise
MN 280 GOSUB 5490:REM set up dli
WM 290 GOSUB 5640:REM screen
DZ 300 GOTO 1230:REM main loop
CB 310 REM ——— DISPLAY CHARACTER ———
IB 320 GOSUB 880:REM get 8 bytes
TI 330 GOSUB 380:REM convert to bitmap
TE 340 GOSUB 660:REM print grid
HZ 350 GOSUB 560:REM print codes
ZL 360 RETURN
WA 370 REM ——— CONVERT TO BITMAP ———
RC 380 FOR L=1 TO 8
RN 390 FOR M=1 TO 8
RS 400 IF CHDEC(L)-BIT(M)<0 THEN CHMAP(M,
   L)=46
MN 410 IF CHDEC(L)-BIT(M)>-1 THEN CHMAP(M
   ,L)=20:CHDEC(L)=CHDEC(L)-BIT(M)
HM 420 NEXT M
HE 430 NEXT L
ZI 440 RETURN
PY 450 REM ——— CONVERT TO 8 BYTES ———
QZ 460 FOR L=1 TO 8
XT 470 CHDEC(L)=0
HO 480 NEXT L
RF 490 FOR L=1 TO 8
OX 500 FOR M=1 TO 8
WO 510 IF CHMAP(M,L)=20 THEN CHDEC(L)=CHD
   EC(L)+BIT(M)
HN 520 NEXT M
HF 530 NEXT L
ZJ 540 RETURN
FK 550 REM ——— PRINT CODES ———
EW 560 POSITION 1,18:PRINT "000"
QV 570 IF ICD>99 THEN POSITION 1,18:PRINT
    ICD:GOTO 600
YI 580 IF ICD>9 THEN POSITION 2,18:PRINT
   ICD:GOTO 600
GQ 590 IF ICD<10 THEN POSITION 3,18:PRINT
    ICD
HD 600 POSITION 6,18:PRINT "000"
OX 610 IF ACD>99 THEN POSITION 6,18:PRINT
    ACD:GOTO 640
WJ 620 IF ACD>9 THEN POSITION 7,18:PRINT
   ACD:GOTO 640
XA 630 IF ACD<10 THEN POSITION 8,18:PRINT
    ACD
ZK 640 RETURN
KF 650 REM ——— DISPLAY CHAR GRID ———
JM 660 POKE 752,1
RD 670 FOR L=1 TO 8
RO 680 FOR M=1 TO 8
LH 690 POSITION M,L+8:PRINT CHR$(CHMAP(M,
   L));
HL 700 NEXT M
TK 710 PRINT
HF 720 NEXT L
UN 730 POKE 752,0:RETURN
HV 740 REM ——— ASCII > INTERNAL ———
MX 750 IF ACD>-1 AND ACD<32 THEN ICD=ACD+
   64
VC 760 IF ACD>31 AND ACD<96 THEN ICD=ACD-
   32
LZ 770 IF ACD>95 AND ACD<128 THEN ICD=ACD
OI 780 IF ACD>127 AND ACD<160 THEN ICD=AC
   D+64
NE 790 IF ACD>159 AND ACD<224 THEN ICD=AC
   D-32
```

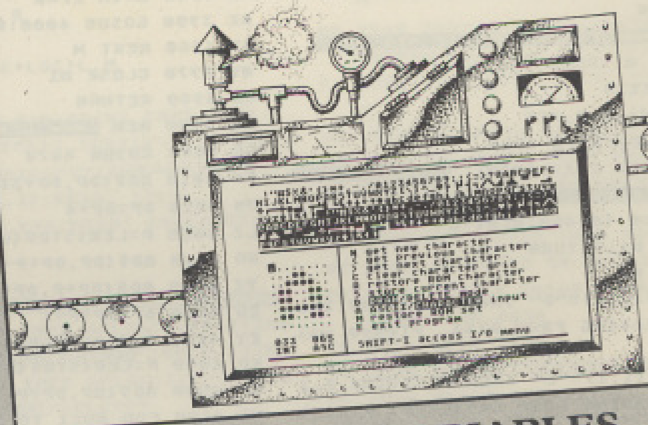
```
PS 800 IF ACD>223 AND ACD<255 THEN ICD=ACD
ZG 810 RETURN
IV 820 REM —— INTERNAL > ASCII ——
MM 830 IF ICD>0 AND ICD<64 THEN ACD=ICD+32
OM 840 IF ICD>63 AND ICD<96 THEN ACD=ICD-64
VK 850 IF ICD>95 AND ICD<128 THEN ACD=ICD
ZQ 860 RETURN
NH 870 REM —— GET CHAR VALUES ——
ZJ 880 LOC=ICD*8:LOC=LOC-1
RJ 890 FOR L=1 TO 8
RM 900 CHDEC(L)=PEEK(CHBASE+LOC+L)
HF 910 NEXT L
ZJ 920 RETURN
UT 930 REM —— COPY CHAR SET TO RAM ——
AH 940 RESTORE 990
TY 950 FOR L=1 TO 33:READ M
DT 960 ML$(L)=CHR$(M):NEXT L
ZT 970 RETURN
GG 980 Q=USR(ADR(ML$),ST,CHBASE,4):RETURN
QV 990 DATA 104,104,133,205,104,133
DY 1000 DATA 204,104,133,207,104,133
FS 1010 DATA 206,104,104,170,160,0
TU 1020 DATA 177,204,145,206,136,208
FD 1030 DATA 249,230,205,230,207,202
FE 1040 DATA 208,242,96
PA 1050 REM — MOVE CHARACTER CURSOR —
LZ 1060 POSITION X,Y+8:PRINT CHR$(158);
XH 1070 IF KEY=6 THEN X=X-1
WD 1080 IF KEY=7 THEN X=X+1
ZO 1090 IF KEY=14 THEN Y=Y-1
XH 1100 IF KEY=15 THEN Y=Y+1
EN 1110 IF Y=0 THEN Y=8
DP 1120 IF X=0 THEN X=8
CD 1130 IF X=9 THEN X=1
DH 1140 IF Y=9 THEN Y=1
MH 1150 FOR V=15 TO 0 STEP -5:SOUND 0,V,10,V:NEXT V
MB 1160 POSITION X,Y+8:PRINT CHR$(158);
AW 1170 RETURN
WU 1180 REM —— ENABLE DLI ——
UY 1190 POKE DL+11,PEEK(DL+11)+128
BR 1200 POKE 54286,192
AG 1210 RETURN
CT 1220 REM —— MAIN LOOP ——
GE 1230 POKE 764,255
XW 1240 KEY=PEEK(764)
LY 1250 IF KEY=255 THEN 1240
GR 1260 IF KEY=14 OR KEY=15 OR KEY=6 OR KEY=7 THEN GOSUB 1060:GOTO 1230
PC 1270 IF KEY=33 THEN GOSUB 1960:GOTO 1230:REM draw or delete
FE 1280 IF KEY=35 THEN GOSUB 1410:GOTO 1230:REM new char
LX 1290 IF KEY=18 THEN GOSUB 1530:GOTO 1230:REM clear character
FI 1300 IF KEY=40 THEN GOSUB 1660:GOTO 1230:REM restore original character
AM 1310 IF KEY=62 THEN GOSUB 1780:GOTO 1230:REM store new character
MV 1320 IF KEY=58 THEN GOSUB 1910:GOTO 1230:REM draw or delete toggle
EZ 1330 IF KEY=77 THEN GOSUB 2290:GOTO 1230:REM save/load menu
JJ 1340 IF KEY=55 THEN GOSUB 2080:GOTO 1230:REM next char
BE 1350 IF KEY=54 THEN GOSUB 2150:GOTO 1230:REM previous char
LU 1360 IF KEY=63 THEN GOSUB 2020:GOTO 1230:REM A - ASCII/string toggle
WI 1370 IF KEY=37 THEN GOSUB 2220:GOTO 1230:REM M - copy ROM set
ED 1380 IF KEY=42 THEN GOTO 5940:GOTO 1230:REM E - exit program
QG 1390 GOTO 1230
BM 1400 REM —— N - GET NEW CHAR ——
TW 1410 POSITION 0,22:PRINT SPC$;:POKE 764,255:POKE 766,1:TRAP 1410
BK 1420 IF AFLAG=1 THEN POSITION 2,22:PRINT "Enter ATASCII code ";:INPUT #16;ACD
MK 1430 IF AFLAG=2 THEN POSITION 2,22:PRINT "Enter character ";:INPUT #16;C$:ACD=ASC(C$)
GV 1440 IF ACD<0 OR ACD>127 THEN GOTO 1410
RB 1450 IF AFLAG=2 AND C$="" THEN POKE 766,0:GOTO 1500
QZ 1460 TRAP 32767:POKE 766,0
DV 1470 GOSUB 750:REM ascii-internal
PI 1480 GOSUB 320:REM display char
VB 1490 POSITION 0,22:PRINT TTL$;
BI 1500 POSITION X,Y+8:PRINT CHR$(253);CHR$(158);
AM 1510 RETURN
NW 1520 REM —— C - CLEAR CHAR GRID ——
FP 1530 POSITION 0,22:PRINT SPC$;
SJ 1540 POSITION 2,22:PRINT "Clearing character.";
CD 1550 FOR L=1 TO 8
CQ 1560 FOR M=1 TO 8
TU 1570 IF DFLAG=2 THEN CHMAP(L,M)=46
IY 1580 IF DFLAG=1 THEN CHMAP(L,M)=20
HS 1590 NEXT M
GI 1600 NEXT L
GQ 1610 GOSUB 660:REM print grid
UK 1620 POSITION 0,22:PRINT TTL$;
BT 1630 POSITION X,Y+8:PRINT CHR$(253);CHR$(158);
AX 1640 RETURN
BS 1650 REM —— R - RESTORE CHAR ——
GA 1660 POSITION 0,22:PRINT SPC$;
ND 1670 POSITION 2,22:PRINT "Restoring ROM character.";
EK 1680 LOC=ICD*8:LOC=LOC-1
CR 1690 FOR L=1 TO 8
BP 1700 CHDEC(L)=PEEK(ST+LOC+L)
GN 1710 NEXT L
NL 1720 GOSUB 380:REM conv. to bitmap
GY 1730 GOSUB 660:REM print grid
US 1740 POSITION 0,22:PRINT TTL$;
CB 1750 POSITION X,Y+8:PRINT CHR$(253);CHR$(158);
BF 1760 RETURN
AG 1770 REM —— S - STORE CHAR ——
GI 1780 POSITION 0,22:PRINT SPC$;
OE 1790 POSITION 2,22:PRINT "Storing character.";
OZ 1800 GOSUB 460:REM conv. to 8 bytes
BX 1810 FOR L=1 TO 8
QC 1820 M=CHDEC(L)
PP 1830 POKE CHBASE+LOC+L,M
GY 1840 NEXT L
MM 1850 POSITION X,Y+8:PRINT CHR$(158);
JF 1860 IF CHALT$(ICD+1,ICD+1)="0" THEN CHALT$(ICD+1,ICD+1)="1":CHNUM=CHNUM+1
VD 1870 POSITION 0,22:PRINT TTL$;
CM 1880 POSITION X,Y+8:PRINT CHR$(253);CHR$(158);
BQ 1890 RETURN
DX 1900 REM —— D - DRAW/DELETE ——
HF 1910 IF DFLAG=1 THEN DFLAG=2:POSITION 14,14:PRINT "■DRAW/DELETE":GOTO 1930
RF 1920 IF DFLAG=2 THEN DFLAG=1:POSITION 14,14:PRINT "■DRAW/DELETE"
MI 1930 POSITION X,Y+8:PRINT CHR$(158);
BD 1940 RETURN
AY 1950 REM —— PLOT OR DELETE ——
BO 1960 IF DFLAG=1 THEN POSITION X,Y+8:PRINT "●";:CHMAP(X,Y)=20:F=60:GOTO 1980
CF 1970 IF DFLAG=2 THEN POSITION X,Y+8:PRINT ".";:CHMAP(X,Y)=46:F=240:GOTO 1980
PC 1980 FOR V=15 TO 0 STEP -3:SOUND 0,F,10,V:NEXT V
NA 1990 POSITION X,Y+8:PRINT CHR$(158);
AA 2000 RETURN
XV 2010 REM —— A - ASCII/CHAR ——
FD 2020 POSITION 0,22:PRINT SPC$;
YD 2030 IF AFLAG=1 THEN AFLAG=2:POSITION 14,15:PRINT "■ASCII/CHARACTER";:GOTO 2050
KF 2040 AFLAG=1:POSITION 14,15:PRINT "■ASCII/CHARACTER";
LX 2050 POSITION X,Y+8:PRINT CHR$(158);
AS 2060 RETURN
QI 2070 REM —— > GET NEXT CHAR ——
EG 2080 ICD=ICD+1
IE 2090 IF ICD=128 THEN ICD=0
KV 2100 GOSUB 830:REM int-asc
OI 2110 GOSUB 320:REM display char
BH 2120 POSITION X,Y+8:PRINT CHR$(253);CHR$(158);
AL 2130 RETURN
EZ 2140 REM —— < GET LAST CHAR ——
EZ 2150 ICD=ICD-1
CV 2160 IF ICD=-1 THEN ICD=127
LQ 2170 GOSUB 830:REM int-asc
PD 2180 GOSUB 320:REM display char
CC 2190 POSITION X,Y+8:PRINT CHR$(253);CHR$(158);
AE 2200 RETURN
DG 2210 REM —— M - COPY CHAR SET ——
IY 2220 CHNUM=0
NO 2230 CHALT$(1)="0":CHALT$(128)="0":CHALT$(2)=CHALT$
GR 2240 GOSUB 980:REM copy char set
UM 2250 POSITION 0,22:PRINT TTL$;
BV 2260 POSITION X,Y+8:PRINT CHR$(253);CHR$(158);
AZ 2270 RETURN
ZG 2280 REM —— INPUT/OUTPUT MENU ——
BZ 2290 GRAPHICS 0
RK 2300 SETCOLOR 2,3,4:SETCOLOR 1,1,12
LC 2310 POKE 752,0:POKE 764,255:POKE 65,0
SF 2320 POSITION 12,0:PRINT "I/O OPTIONS"
WJ 2330 POSITION 12,1:PRINT "———————————"
HN 2340 POKE 82,0:POKE 83,39
IB 2350 POSITION 0,2:PRINT "   SAVE :-"
RY 2360 PRINT
SU 2370 PRINT " 1 WHOLE font."
CS 2380 PRINT " 2 DATA statements for WHOLE font."
ZK 2390 PRINT " 3 PARTIAL font."
NM 2400 PRINT " 4 DATA statements for PARTIAL font."
RL 2410 PRINT
VV 2420 PRINT "   LOAD :-"
RR 2430 PRINT
UR 2440 PRINT " 5 WHOLE font."
AQ 2450 PRINT " 6 PARTIAL font."
SA 2460 PRINT
ES 2470 PRINT "   DISPLAY :-"
SG 2480 PRINT
TL 2490 PRINT " 7 Directory."
RK 2500 PRINT
VT 2510 PRINT "   OR :-"
RQ 2520 PRINT
II 2530 PRINT " 8 Return to main program."
HP 2540 POSITION 1,22:PRINT "■ Select required option    ++++";
IJ 2550 TRAP 2540:INPUT #16;OPT:TRAP 32767
MN 2560 IF OPT<1 OR OPT>8 THEN GOTO 2540
XR 2570 IF OPT=8 THEN GOSUB 5640:RETURN
HT 2580 IF OPT>0 AND OPT<5 THEN GOSUB 2630
GO 2590 IF OPT<>7 THEN GOSUB 2760
OZ 2595 IF OPT=2 OR OPT=3 THEN CHNUM=128
EB 2600 ON OPT GOSUB 2920,3800,2920,3890,3190,3190,4850
TA 2610 GOTO 2290
ZH 2620 REM —— GET LINE NUMBERS ——
MT 2630 PRINT CHR$(125)
PO 2640 POKE 752,0:LFLAG=0
NP 2650 SETCOLOR 2,4,6
BN 2660 POSITION 2,5:PRINT "Generate loader subroutine ";
JN 2670 TRAP 2630:INPUT C$:IF C$="" THEN 2630
BY 2680 IF C$<>"Y" AND C$<>"y" THEN RETURN
MY 2690 LFLAG=1:TRAP 2690
GH 2700 POSITION 2,7:PRINT "Start line no. ";:INPUT #16;L1
WF 2710 IF L1<1 OR L1>32700 THEN 2700
DN 2720 POSITION 2,9:PRINT "Increment ";:INPUT #16;L2
CT 2730 IF L2<1 OR L2>1000 THEN 2720
BA 2740 RETURN
LA 2750 REM —— GET FILENAME ——
NE 2760 PRINT CHR$(125)
KK 2770 POSITION 2,5:PRINT "Enter font name : ";
JG 2780 TRAP 2760:INPUT #16,FN$
LS 2790 IF FN$="" THEN POP :GOTO 2290
DB 2800 GOSUB 4540
DS 2810 IF EM$(1,1)="■" THEN 2880
PZ 2820 IF OPT=1 OR OPT=3 THEN POSITION 2,7:PRINT "The font will be saved as :-":PRINT "  ";FF$
EM 2830 IF OPT=5 OR OPT=6 THEN POSITION 2,7:PRINT "The font to be loaded is :-":PRINT "  ";FF$
MO 2840 IF OPT=2 OR OPT=4 THEN POSITION 2
```

```
    ,7:PRINT "The font will be saved as :-
    ":PRINT " ";FL$
AD 2850 IF (OPT=1 OR OPT=3) AND LFLAG=1 T
    HEN POSITION 2,9:PRINT "The loader wil
    l be saved as :-":PRINT " ";FL$
NS 2860 CLOSE #1
BL 2870 RETURN
DM 2880 POSITION 2,20:PRINT EM$
NA 2890 FOR A=0 TO 400:NEXT A
TY 2900 GOTO 2760
JH 2910 REM ── SAVE COMPLETE SET ──
DC 2920 CLOSE #1:POKE 752,1
VA 2930 TRAP 2990
IP 2940 OPEN #1,4,0,FF$
NR 2950 CLOSE #1
GN 2960 POSITION 2,12:PRINT "File alread
    y exists. Are you sure? ";
UM 2970 INPUT #16;C$
CE 2980 IF C$<>"Y" AND C$<>"y" THEN RETUR
    N
OD 2990 CLOSE #1
VQ 3000 IF FF$(1,1)="D" THEN POSITION 2,1
    4:PRINT "WRITING TO DISK. Please wait
    ... "
DO 3010 IF FF$(1,1)="C" THEN POSITION 2,1
    4:PRINT "WRITING TO CASSETTE. Please w
    ait ... "
RZ 3020 IF OPT<>1 THEN 3040
YK 3030 CHALT$(1)="1":CHALT$(128)="1":CHA
    LT$(2)=CHALT$:CHNUM=128
KC 3040 OPEN #1,8,0,FF$
OA 3050 PUT #1,CHNUM
FI 3060 FOR A=1 TO CHNUM
DR 3070 IF CHALT$(A,A)="0" THEN 3140
JL 3080 PUT #1,A-1
MC 3090 B=CHBASE+((A-1)*8)
WT 3100 FOR C=0 TO 7
QI 3110 D=PEEK(B+C)
JV 3120 PUT #1,D
CO 3130 NEXT C
BV 3140 NEXT A
NC 3150 CLOSE #1
RM 3160 IF LFLAG=1 THEN GOSUB 3440
AY 3170 RETURN
ZR 3180 REM ── LOAD COMPLETE SET ──
DI 3190 CLOSE #1:POKE 752,1
OJ 3200 TRAP 3230
HT 3210 OPEN #1,4,0,FF$
SK 3220 CLOSE #1:GOTO 3260
EO 3230 POSITION 2,12:PRINT "Error - Fil
    e does not exist. "
MA 3240 FOR A=0 TO 400:NEXT A
DW 3250 CLOSE #1:RETURN
NH 3260 CLOSE #1
LM 3270 IF FF$(1,1)="D" THEN POSITION 2,1
    4:PRINT "READING FROM DISK. Please wai
    t ... "
QW 3280 IF FF$(1,1)="C" THEN POSITION 2,1
    4:PRINT "READING FROM CASSETTE. Please
     wait ... "
IH 3290 CHALT$(1)="0":CHALT$(128)="0":CHA
    LT$(2)=CHALT$:CHNUM=0
HS 3300 OPEN #1,4,0,FF$
HK 3310 GET #1,CHNUM
FC 3320 FOR A=1 TO CHNUM
CS 3330 GET #1,B
VP 3340 C=CHBASE+(B*8)
FG 3350 CHALT$(B+1,B+1)="1"
XZ 3360 FOR D=0 TO 7
ER 3370 GET #1,E
KP 3380 POKE C+D,E
DV 3390 NEXT D
BP 3400 NEXT A
MW 3410 CLOSE #1
AP 3420 RETURN
GJ 3430 REM ── CREATE DISK LOADER ──
CZ 3440 CLOSE #1:POKE 752,1
TA 3450 TRAP 3490
MW 3460 OPEN #1,4,0,FL$
JB 3470 POSITION 2,16:PRINT "File alread
    y exists. Are you sure? ";
UG 3480 INPUT #16;C$
FK 3490 IF C$<>"Y" AND C$<>"y" THEN CLOSE
     #1:POP :RETURN
MV 3500 CLOSE #1
ON 3510 OPEN #1,8,0,FL$
VR 3520 L=L1
LG 3530 FOR M=1 TO 19
EL 3540 GOSUB 4470
WD 3550 GOSUB 3600+(M-1)*10
ZO 3560 PRINT #1;BD$
HO 3570 NEXT M
NT 3580 CLOSE #1
BM 3590 RETURN
LV 3600 BD$(DP)="GR.0":RETURN
XR 3610 BD$(DP)="POKE106,PEEK(106)-8":RET
    URN
MB 3620 BD$(DP)="GR.0":RETURN
ZV 3630 BD$(DP)="P=PEEK(106)+4":RETURN
VL 3640 BD$(DP)="CH=P*256":RETURN
BD 3650 BD$(DP)="CLOSE#1":RETURN
PW 3660 BD$(DP)="OPEN#1,4,0,":BD$(LEN(BD$
    )+1)=CHR$(34):BD$(LEN(BD$)+1)=FF$:BD$(
    LEN(BD$)+1)=CHR$(34):RETURN
LD 3670 BD$(DP)="GET#1,N":RETURN
ZP 3680 BD$(DP)="FORA=1TON":RETURN
BR 3690 BD$(DP)="GET#1,B":RETURN
HL 3700 BD$(DP)="C=CH+(B*8)":RETURN
FV 3710 BD$(DP)="FORD=0TO7":RETURN
DJ 3720 BD$(DP)="GET#1,E":RETURN
EI 3730 BD$(DP)="POKEC+D,E":RETURN
CM 3740 BD$(DP)="NEXTD":RETURN
AK 3750 BD$(DP)="NEXTA":RETURN
BI 3760 BD$(DP)="CLOSE#1":RETURN
CD 3770 BD$(DP)="POKE756,P":RETURN
RO 3780 BD$(DP)="RETURN":RETURN
YD 3790 REM ── DATA FOR ALL SET ──
OQ 3800 OPEN #1,8,0,FL$
VU 3810 L=L1
LU 3820 IF LFLAG=1 THEN GOSUB 4200
LL 3830 FOR C=0 TO 1016 STEP 8
RU 3840 GOSUB 4000:REM generate stmt
DI 3850 NEXT C
NT 3860 CLOSE #1
BM 3870 RETURN
BD 3880 REM ── DATA FOR PART SET ──
PR 3890 OPEN #1,8,0,FL$
VT 3900 L=L1
LT 3910 IF LFLAG=1 THEN GOSUB 4200
VN 3920 FOR M=1 TO 128
ZP 3930 IF CHALT$(M,M)="0" THEN GOTO 3960
WW 3940 C=(M-1)*8
RZ 3950 GOSUB 4000:REM generate stmt
HT 3960 NEXT M
NY 3970 CLOSE #1
BR 3980 RETURN
OA 3990 REM ── GENERATE DATA STMT ──
DQ 4000 GOSUB 4470
FP 4010 BD$(DP,DP+3)="DATA"
VN 4020 DP=DP+4
LZ 4030 P=LEN(STR$(C/8))
XO 4040 BD$(DP,DP+P-1)=STR$(C/8)
YZ 4050 BD$(DP+P,DP+P)=","
EU 4060 DP=DP+P+1
EY 4070 B=PEEK(CHBASE+C)
KD 4080 P=LEN(STR$(B))
OW 4090 BD$(DP,DP+P-1)=STR$(B)
WI 4100 FOR BV=1 TO 7
YP 4110 BD$(DP+P,DP+P)=","
EK 4120 DP=DP+P+1
TY 4130 B=PEEK(CHBASE+C+BV)
JT 4140 P=LEN(STR$(B))
OM 4150 BD$(DP,DP+P-1)=STR$(B)
QF 4160 NEXT BV
ZK 4170 PRINT #1;BD$
BC 4180 RETURN
RT 4190 REM ── CREATE DATA LOADER ──
DU 4200 GOSUB 4470
CG 4210 BD$(DP,DP+6)="RESTORE"
QT 4220 BD$(DP+7,DP+7+LEN(STR$(L1+16*L2))
    -1)=STR$(L1+16*L2)
ZA 4230 PRINT #1;BD$
IK 4240 FOR M=1 TO 15
EJ 4250 GOSUB 4470
ZF 4260 GOSUB 4300+((M-1)*10)
ZM 4270 PRINT #1;BD$
HM 4280 NEXT M
BH 4290 RETURN
XJ 4300 BD$(DP)="POKE106,PEEK(106)-8":RET
    URN
LT 4310 BD$(DP)="GR.0":RETURN
ZN 4320 BD$(DP)="P=PEEK(106)+4":RETURN
VD 4330 BD$(DP)="CH=P*256":RETURN
EL 4340 BD$(DP)="N="
LG 4350 BD$(DP+2)=STR$(CHNUM):RETURN
ZE 4360 BD$(DP)="FORA=1TON":RETURN
DH 4370 BD$(DP)="READB":RETURN
IC 4380 BD$(DP)="C=CH+(B*8)":RETURN
GM 4390 BD$(DP)="FORD=0TO7":RETURN
ET 4400 BD$(DP)="READE":RETURN
DX 4410 BD$(DP)="POKEC+D,E":RETURN
CB 4420 BD$(DP)="NEXTD":RETURN
ZZ 4430 BD$(DP)="NEXTA":RETURN
BP 4440 BD$(DP)="POKE756,P":RETURN
RA 4450 BD$(DP)="RETURN":RETURN
ER 4460 REM ── SET UP LINE NUMBER ──
PC 4470 BD$=""
QZ 4480 P=LEN(STR$(L))
RG 4490 BD$(1,P)=STR$(L)
QD 4500 DP=P+1
RX 4510 L=L+L2
AS 4520 RETURN
EB 4530 REM ── FILENAME PARSER ──
PI 4540 POKE 752,1
OM 4550 DV$=" "
VE 4560 EM$(1)=" ":EM$(15)=" ":EM$(2)=EM$
ZX 4570 FF$(1)=" ":FF$(15)=" ":FF$(2)=FF$
VG 4580 FL$(1)=" ":FL$(15)=" ":FL$(2)=FL$
MR 4590 FX$(1)=" ":FX$(16)=" ":FX$(2)=FX$
PJ 4600 FX$(1,16)=FN$
EM 4610 IF FX$(1,2)="C:" THEN DV$="C:":GO
    TO 32767
PM 4620 IF FX$(1,2)="D:" THEN DV$="D1:":M
    =3:GOTO 4670
NN 4630 IF FX$(1,1)<>"D" THEN DV$="D1:":M
    =1:GOTO 4670
OI 4640 IF FX$(2,2)>"0" AND (FX$(2,2)<="4
    " OR FX$(2,2)="8") AND FX$(3,3)=":" TH
    EN DV$=FX$(1,3):M=4:GOTO 4670
AQ 4650 DV$="D1:"
XF 4660 M=1
BJ 4670 C=0:L=M
IT 4680 IF FX$(L,L)=" " THEN GOTO 4740
TC 4690 IF FX$(L,L)="." THEN GOTO 4740
WQ 4700 IF C=8 THEN GOTO 4740
HR 4710 C=C+1
XC 4720 IF (FX$(L,L)>="A" AND FX$(L,L)<="
    Z") OR (FX$(L,L)>="0" AND FX$(L,L)<="9
    ") THEN L=L+1:GOTO 4680
TN 4730 GOTO 4820
RD 4740 IF FX$(L,L)<>" " AND FX$(L,L)<>".
    " AND C=8 THEN EM$="■ Name too long !"
    :GOTO 32767
DW 4750 FF$(1,3)=DV$
TG 4760 FF$(4,15)=FX$(M,L-1)
IH 4770 FF$(L-M+4,15)=".FNT"
FV 4780 FL$(1,3)=DV$
VF 4790 FL$(4,15)=FX$(M,L-1)
SR 4800 FL$(L-M+4,15)=".LST"
TW 4810 GOTO 4830
JN 4820 EM$="■ Invalid name !"
UY 4830 POKE 752,0:RETURN
JB 4840 REM ── LIST DISK DIRECTORY ──
NF 4850 PRINT CHR$(125)
TJ 4860 SETCOLOR 2,2,6:SETCOLOR 1,1,12
BM 4870 POSITION 14,2:PRINT "DIRECTORY"
QR 4880 POSITION 2,8:PRINT "1) .FNT files
    "
OE 4890 POSITION 2,10:PRINT "2) .LST file
    s"
DJ 4900 POSITION 2,12:PRINT "3) ALL files
    "
GM 4910 POSITION 2,14:PRINT "Select ";
TA 4920 TRAP 4910:INPUT DT
EQ 4930 IF DT<1 OR DT>3 THEN 4910
AJ 4940 TRAP 32767
MT 4950 IF DT=1 THEN DIR$="D:*.FNT"
ZU 4960 IF DT=2 THEN DIR$="D:*.LST"
XX 4970 IF DT=3 THEN DIR$="D:*.*"
NQ 4980 PRINT CHR$(125)
XW 4990 CLOSE #3:OPEN #3,6,0,DIR$
FE 5000 PG=0:POSITION 2,3:POKE 82,2
UL 5010 FOR D=1 TO 16:TRAP 5060
DG 5020 INPUT #3,FN$:PRINT FN$
CZ 5030 NEXT D
SI 5040 IF  NOT PG THEN PG=1:POKE 82,21:P
    OSITION 21,3:GOTO 5010
HE 5050 POKE 82,0:POKE 764,255
HX 5060 POSITION 0,23:PRINT " HIT RETURN
    ■";
BW 5070 IF PEEK(764)=255 THEN 5070
GG 5080 TRAP 32767:RETURN
OP 5090 REM ── INITIALISATION ──
AZ 5100 GRAPHICS 0
KH 5110 POKE 106,PEEK(106)-8
RL 5120 GRAPHICS 0:SETCOLOR 2,8,8:SETCOLO
    R 1,0,0
```

```
UU 5130 POSITION 12,2:PRINT "THE FONT FAC
     TORY"
TW 5140 POSITION 11,3:PRINT "──────────────
     ───"
AB 5150 POSITION 12,7:PRINT "By Sarah Kea
     tes";
QH 5160 POSITION 6,9:PRINT "Sint-Genesius
     -Rode , Belgium"
EA 5170 POSITION 14,12:PRINT " Please wai
     t "
TA 5180 POSITION 8,16:PRINT " Copying ROM
      character set ←";
ES 5190 PAGE=PEEK(106)+4
YR 5200 CHBASE=PAGE*256
ZX 5210 ST=PEEK(756)*256
PL 5220 DIM CHMAP(8,8),CHDEC(8),CHALT$(12
     8),BIT(8),GRID$(8),C$(1),SPC$(40),TTL$
     (40),LN$(40),ML$(80),ML2$(10)
CE 5230 DIM DLI$(16),FN$(20),FF$(15),FL$(
     15),FX$(16),EM$(20),DIR$(7),DE$(20),BD
     $(45),DV$(3)
AF 5240 GOSUB 940:GOSUB 980
QL 5250 RESTORE 5290
UT 5260 FOR L=1 TO 10:READ M
IA 5270 ML2$(L,L)=CHR$(M)
MC 5280 NEXT L
PY 5290 DATA 104,160,255,152,145,88
UX 5300 DATA 136,208,250,96
PC 5310 CHNUM=0:ACD=0:ICD=0
PN 5320 RESTORE 5370
BX 5330 FOR L=1 TO 8
VL 5340 READ M
FL 5350 BIT(L)=M
GY 5360 NEXT L
EE 5370 DATA 128,64,32,16,8,4,2,1
AG 5380 SPC$(1)=" ":SPC$(40)=" ":SPC$(2)=
     SPC$:TTL$=" THE FONT FACTORY - By Sar
     ah Keates "
BS 5390 LN$(1)=CHR$(18):LN$(40)=CHR$(18):
     LN$(2)=LN$
NM 5400 CHALT$(1)="0":CHALT$(128)="0":CHA
     LT$(2)=CHALT$
CD 5410 FOR M=1 TO 8
BW 5420 FOR L=1 TO 8
HI 5430 CHMAP(L,M)=0
GU 5440 NEXT L
EQ 5450 CHDEC(M)=0
HL 5460 NEXT M
BG 5470 RETURN
FE 5480 REM ━━━━━━━━ SET UP DLI ━━━━━━━━
NV 5490 RESTORE 5600
IN 5500 FOR L=1 TO 16
VG 5510 READ M
MR 5520 DLI$(L,L)=CHR$(M)
GT 5530 NEXT L
OC 5540 HI=INT(ADR(DLI$)/256)
TW 5550 LO=ADR(DLI$)-256*HI
ZC 5560 POKE 512,LO
TS 5570 POKE 513,HI
VL 5580 DL=PEEK(560)+256*PEEK(561)
BO 5590 RETURN
GK 5600 DATA 72,169,70,141,10,212
GC 5610 DATA 141,24,208,169,224,141
BV 5620 DATA 9,212,104,64
YH 5630 REM ━━━━━━ SET UP SCREEN ━━━━━━
MZ 5640 PRINT CHR$(125)
WK 5650 SETCOLOR 2,7,6:SETCOLOR 1,1,12
EI 5660 POKE 82,0:POKE 752,1:POKE 730,1:P
     OKE 731,1
TC 5670 GOSUB 1190:REM enable dli
GI 5680 POSITION 0,7:PRINT LN$
RD 5690 POSITION 10,7:PRINT "┬"
HT 5700 POSITION 0,8:PRINT "          | N
      get new character"
UC 5710 PRINT " ....... | < get previous
      character"
UW 5720 PRINT " ....... | > get next cha
     racter  "
FG 5730 PRINT " ....... | C clear charac
     ter grid  "
IE 5740 PRINT " ....... | R restore ROM
     character"
HJ 5750 PRINT " ....... | S store curren
     t character"
GB 5760 PRINT " ....... | D DRAW/DELETE
     mode    "
JG 5770 PRINT " ....... | A ASCII/CHARAC
     TER input"
UN 5780 PRINT " ....... | M restore ROM
     set       "
TD 5790 PRINT "         | E exit program
          "
AB 5800 PRINT " 000  000 |"
HX 5810 PRINT " INT  ASC | SHIFT-I access
      I/O menu "
UZ 5820 PRINT LN$
TN 5830 POSITION 10,20:PRINT "┴"
CF 5840 DFLAG=1:X=1:Y=1:AFLAG=2
YB 5850 POKE 752,0:POKE 756,PAGE
MT 5860 POSITION X,Y+8:PRINT CHR$(158);
AK 5870 POKE 82,0:POKE 752,1
YS 5880 Q=USR(ADR(ML2$))
PP 5890 POKE 752,0
EH 5900 ICD=33:ACD=65:GOSUB 320
MG 5910 POSITION X,Y+8:PRINT CHR$(158);
BB 5920 RETURN
ZB 5930 REM ━━━━━━ EXIT PROGRAM ━━━━━━
YI 5940 POSITION 0,22:PRINT SPC$;:POKE 76
     4,255
DG 5950 POSITION 0,22:PRINT "▣ ARE YOU SU
     RE ";
EW 5960 INPUT C$
OV 5970 IF C$<>"Y" AND C$<>"y" THEN POSIT
     ION 0,22:PRINT TTL$;:GOTO 1230
CN 5980 GRAPHICS 0
OI 5990 POKE 756,PAGE
VK 6000 SETCOLOR 2,7,6:SETCOLOR 1,1,12
EV 6010 END
```

PROGRAM BREAKDOWN

310-360 – Calls the subroutines to display a character.
370-440 – Converts the 8 decimal values for a character into a bitmap.
450-540 – Converts a bitmap to 8 decimal values.
550-640 – Prints the internal and ATASCII codes for a character.
650-730 – Prints the character grid.
740-810 – Converts an ATASCII code into an internal code.
820-860 – Converts an internal code to an ATASCII code.
870-920 – Gets the 8 decimal values for a character from memory.
930-1040 – Copies the ROM character set into RAM.
1050-1170 – Moves the cursor around the grid.
1180-1210 – Enables the display list interrupts.
1220-1390 – Main loop to read the keyboard.
1400-1510 – Selects a new character to be edited.
1520-1640 – Clears the character grid.
1650-1760 Restores a single character to it's ROM counterpart.
1770-1890 – Stores an edited character.
1900-1940 – Toggles between DRAW and DELETE modes.
1950-2000 – Draws or deletes a point.
2010-2060 – Toggles between ATASCII and CHARACTER input mode.
2070-2130 – Gets the next character in the set.
2140-2200 – Gets the previous character in the set.
2210-2270 – Calls the subroutine to copy the ROM character set.
2280-2610 – Displays the Input/Output menu.
2620-2740 – Asks if a loader routine is required.
2750-2900 – Gets a filename and calls the parsing routine.
2910-3170 – Saves a complete character set to disk or cassette.
3180-3420 – Loads a complete character set from disk or cassette.
3430-3780 – Generates a loader subroutine for DATA files.
3790-3870 – Saves DATA for an entire character set.
3880-3980 – Saves DATA for a partial character set.
3990-4180 – Builds a Basic DATA statement.
4190-4430 – Generates a loader subroutine for DATA statements.
4460-4520 – Sets up the line number for a Basic DATA statement.
4530-4830 – Parses a filename.
4840-5080 – Lists the directory for drive 1
5090-5470 – initialises arrays.
5480-5620 – Sets up the machine code for the display list interrupt.
5630-5920 – Sets up the screen display.
5930-6010 – Exits the program.



MAIN VARIABLES

CHBASE	The location of the RAM copy of the character set.
ST	The location of the ROM character set
PAGE	The MSB of CHBASE. This value is POKEd into the character set pointer at location 756
CHMAP(8,8)	The bitmap of the character.
CHDEC(8)	The 8 decimal values of the character.
CHNUM	The number of characters altered.
CHALT$	Used to tell the specific characters that have been altered.
ACD	The ATASCII code of the character.
ICD	The internal code of the character.
AFLAG	Flag to indicate whether the program is in CHARACTER or ATASCII input mode.
DFLAG	Flag to indicate whether the program is in DRAW or DELETE mode.
LFLAG	Flags whether a loader routine is required.
KEY	The code of the key pressed.
ML$	The machine code routine to copy the character set.
ML2$	The machine language routine to print the character set to the screen.
DLI$	The display list interrupt routine.
BD$	The Basic DATA statement.
FF$,FL$	Filenames and extensions '.FNT','.LST'.

A,B,C,D,E,L,M are general purpose variables.

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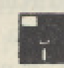


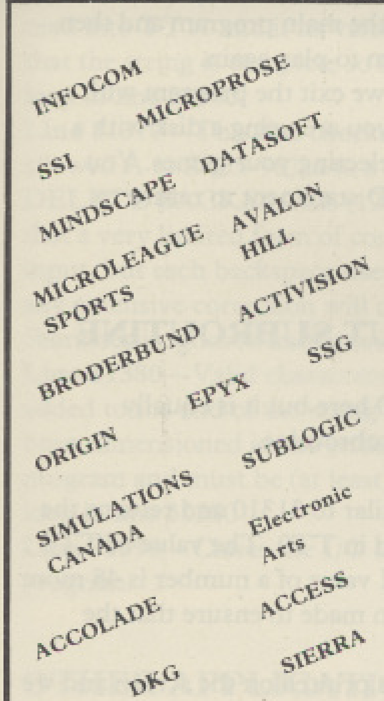
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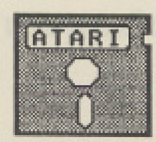
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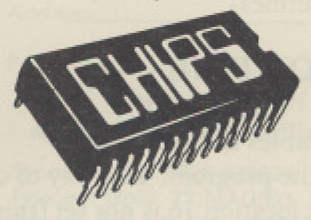
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4. KEYBOARD INPUT

In his continuing series, Ian Finlayson provides some routines to handle keyboard input in your program and explains how they work

In this issue I am going to deal with one of the most common requirements in programming a home computer, that is keyboard input. There are several ways of obtaining an input to a program when required and it is worth giving this aspect of your programs a bit of attention as it can give them a professional feel if it is handled well, or give a rather poor impression if done badly.

WHY NOT USE INPUT?

The most straightforward way of getting an input from the keyboard is through the INPUT command, using "INPUT X" for a number or "INPUT A$" for a string. There are, however, two reasons why INPUT is not my chosen way to obtain a keyboard input. First, for single keystroke entry such as Y/N or single numbers the response is much slicker if there is no need to wait for the RETURN key to be pressed. Then there is also the problem of error trapping which is not easy with INPUT especially when handling strings as the trap works on the whole string after RETURN is pressed and not on the individual keystrokes of the string entry. For these reasons I prefer to use GET instead of INPUT.

DEFENSIVE PROGRAMMING

Before looking at the subroutines themselves let me mention a programming style called 'defensive programming'. In commercial programming where a team may be working on one program this programming technique is essential – each programmer works on his own modules of the program trying to ensure that there is no way that other modules being worked on by other members of the team can conflict with his when they are all combined. This requires a very analytical, protective point of view, and frequently causes the program to be quite complex when simple code appears to fulfill the requirement. Defensive programming is a good technique to adopt in your own programs if you wish to share them widely. In this case you are not protecting against conflict with another part of the program but against mishandling by the user of your program. It is not easy to make your program totally crash proof but it is a good aim. What would happen to your masterpiece if a determined youngster tried to input 'INVERSE CONTROL T' when the program was expecting 'YES' or 'NO'?

Now to an analysis of the subroutines-

YES or NO INPUT SUBROUTINE

Line 31300 – The first statement disables the break key to prevent inadvertent interruption of the program. The way to do this is to ensure that bit 7 at memory location 16 is not set (this means the value in memory location 16 must be less than 128). You may use this during initialisation of your main program, if so it is not needed here in the subroutine but it must be reset after a Graphics call.

POKEing 694 with 0 ensures the keyboard is not in inverse and POKEing 702 with 64 makes sure that normal upper case keyboard input is selected.

Line 31310 – Opens I/O channel 2 for input from the keyboard, clears the screen and prompts "Play again? (Y/N)". The program waits for a key press and when this happens returns the key value (in ATASCII) in the variable TT8 then closes the I/O channel. If TT8 equals 89 'Y' has been pressed and the RUN command restarts the program. Instead of the RUN command we could RETURN to the main program and then GOTO an early line in the program to play again.

Line 31320 – If 'Y' is not pressed we exit the program with a "Goodbye". I have assumed that you are using a disk with a program called MENU on it for selecting your games. You could alternatively just use an END statement to return to Basic.

SINGLE NUMBER INPUT SUBROUTINE

I have not repeated line 31300 here but it is equally applicable for crash proofing this subroutine.

Line 31330 – This line is very similar to 31310 and returns the ATASCII value of the key pressed in TT9. The value of TT9 is then reduced by 48 (The ASCII value of a number is 48 more than its face value). A check is then made to ensure that the value is between 0 and 9.

Line 31340 – The value selected is printed on the screen and we return to the main program with the selected value stored in TT9.

STRING INPUT SUBROUTINE

String input is slightly more complex than the previous examples as we have a series of characters to deal with.

Line 31350 – Opens the keyboard for input, prints a prompt,

```
IQ 31299 REM **        PAGE 6         **
             ** SUBROUTINE TUTORIAL-4 **
             **    YES/NO INPUT       **
MV 31300 IF PEEK(16)>127 THEN POKE 16,(PE
   EK(16)-128):POKE 694,0:POKE 702,64
FN 31310 OPEN #2,4,0,"K:":? "↖↓↓PLAY AGAI
   N? (Y/N): ";:GET #2,TT8:CLOSE #2:IF TT
   8=89 THEN RUN
FH 31320 ? :? "↓↓GOODBYE...  LOADING MENU
   ":RUN "D:MENU"
```

```
TX 31329 REM **        PAGE 6         **
             ** SUBROUTINE TUTORIAL-4 **
             **  NUMBER INPUT  (0-9)  **
WI 31330 OPEN #2,4,0,"K:":? "↖↓↓ENTER A N
   UMBER (0-9): ";:GET #2,TT9:CLOSE #2:TT
   9=TT9-48:IF TT9<0 OR TT9>9 THEN 31330
TW 31340 ? TT9:RETURN
```

```
YY 31349 REM **        PAGE 6         **
             ** SUBROUTINE TUTORIAL-4 **
             **    STRING INPUT       **
JX 31350 OPEN #2,4,0,"K:":? "↖↓↓TYPE IN Y
   OUR NAME :";:FOR TT10=1 TO 20
BB 31360 POKE 702,64:GET #2,TT11:IF TT11=
   155 THEN POP :GOTO 31390
YT 31370 IF (TT11<65 OR TT11>122) AND TT1
   1<>32 AND TT11<>126 OR (TT11>90 AND TT
   11<97) THEN 31360
FA 31380 ? CHR$(TT11);:TT8$(TT10,TT10)=CH
   R$(TT11):NEXT TT10
DM 31390 CLOSE #2:RETURN
```

then starts a FOR NEXT loop for the number of characters you require in the string. I have allowed 20 characters but you can adjust this to suit your requirements.

Line 31360 – The POKE to 702 is here in case the inverse key is inadvertently hit between characters. Next one character is read into TT11 and if its value is 155 (RETURN) it is assumed that the string is complete so the stack is popped and we exit the loop to line 31390.

Line 31370 – This line checks for valid characters. I have allowed A to Z (65-90), a to z (97-122) also SPACE (32) and DELETE BACKSPACE (126). Allowing backspace means that a very limited form of correction can be carried out during input, but each backspace uses up a character from the string so any extensive correction will cause a problem! Any invalid character is ignored and causes a loop back to 31360.

Line 31380 – Valid characters are printed to the screen and also added to the end of the string TT8$. This string must have been dimensioned in the setting-up sequence of the main program and must be (at least) the same size as the FOR NEXT loop in line 31350

Line 31390 – Closes the I/O channel and returns to the main program.

OTHER APPLICATIONS

This method for keyboard input can be tailored to your specific requirements. For example, if you want a number input of more than one digit use the string input subroutine and then change the string back to a number by using VAL(TT8$).

If you are having trouble with any of these subroutines write with a s.a.e. and I will try to assist. **Ian Finlayson, 60, Roundstone Crescent, East Preston, West Sussex**

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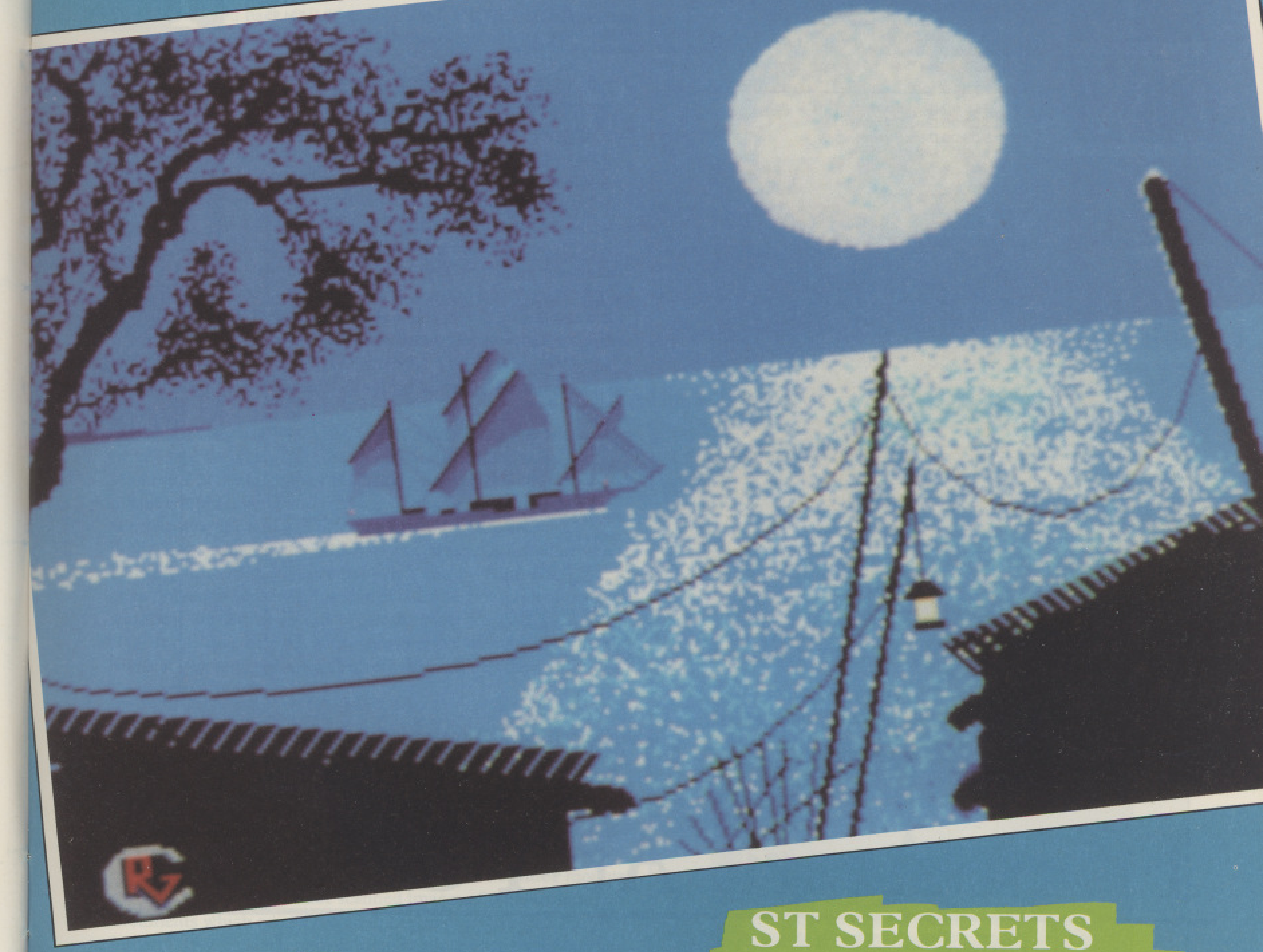
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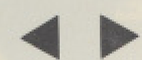
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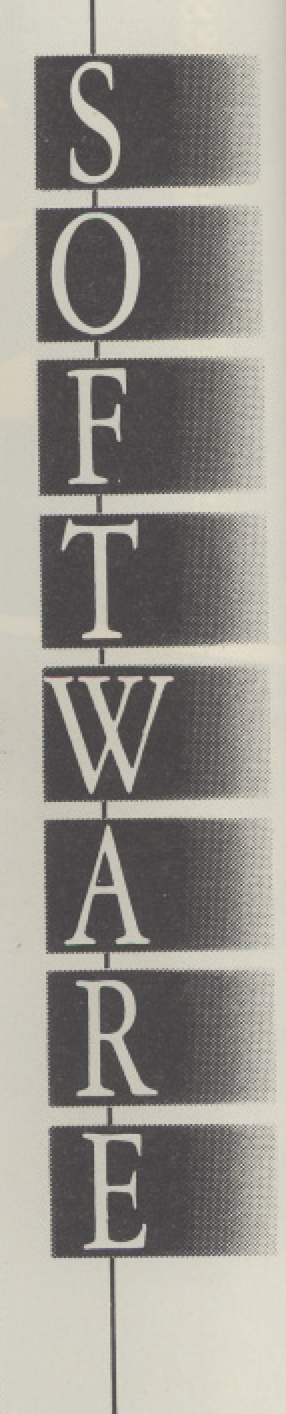
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Digita International, a company already established in the Amstrad market join the growing number of software houses supporting the ST with the announcement of four products, two of which are likely to appeal to all home or business users. **MAILSHOT** is a powerful menu driven mailing list program which uses a unique system of on-screen scrolling of labels and brings WYSIWYG to labelling programs. Routines include detection of duplicate labels, surname sorting and many more. Price will be £24.95 and an enhanced version will be available at £49.95. The second program of interest to home users will be **HOME ACCOUNTS**, a GEM based home accounting program for £24.95 which looks to be very interesting. Digita are also releasing **SPECTRUM ANALYSER** which can link to your Hi-Fi to create an exciting visual image of music.

Signa Publishing Systems Ltd. is a new company headed by Mike Dale, formerly of Haba Systems, that intend to support Desktop Publishing on the ST. The company will import document processing and desktop publishing software from Western Europe and will offer high quality software and hardware peripherals as well as service, training, installation and support. One of the products they carry – **Signum** – is already recognised as having one of the finest outputs of text and there are similar products coming together with hardware such as optical scanners. More information can be had from Signa at Trevenen House, Cricket Hill Lane, Yately, Camberley, Surrey.

Frontier Software have an impressive new line-up of add-ons for the ST following a sole-distributor agreement with E. Arthur Brown Company of the U.S.A. The range of products include a **Solderless Expandable RAM Expansion Board** which is easy to fit and can be expanded later. Initially the unit will upgrade a 520STM to 1Mb but more chips can be added up to 4Mb. Price is £139.95. The **PictaScan Scanner** mounts onto any printer to produce scanned images of photographs and documents which can be stored in Degas or Publishing Partner formats. 10 grey levels and all three resolutions are supported at a price of £149.95. **Invisible Clock Setter** plugs under the ST keyboard to keep the clock running even if the machine is turned off. Price £29.95. Finally there is the first alternative to the ST mouse with **Mouse Ball II** which retails at £39.95.

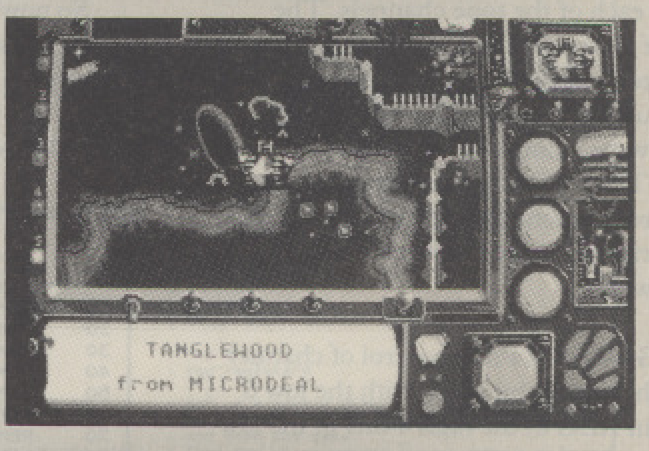
Bug Byte enter the ST market with **MISSING: ONE DROID**, a budget game for just £9.95. The program was written by Paul Lay and was the winner of ANALOG magazine's $5000 dollar programming contest. A fast action shoot 'em up with dozens of screens and 'astonishingly fast game play'.

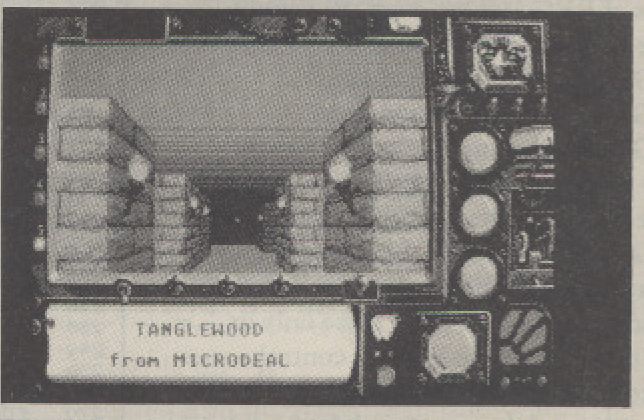
Creation are another new company which is releasing a unique scrolling shoot 'em up called **SKYRIDER** that scrolls from side to side rather than vertically. A futuristic game with graphics similar to Goldrunner, it features six minutes of sampled music plus sound effects and animated backgrounds. Price is £14.95.

TANGLEWOOD

TANGLEWOOD from **Microdeal** looks as if it could be the best arcade adventure yet to be released for the ST. The program will cost £19.95 and looks to be worth every penny. Let the pictures tell the story and get hold of the demo disk, if you can.







Also from **Microdeal** are **LEATHERNECK**, a commando action game, **ST SOCCER** and **FRIGHT NIGHT**, an 'Adult Only' game based on the film. All at £19.95. From Michtron will be **QUICK PAGE**, a simple page layout program that can combine text and graphics for single page advertising, press releases, newssheets etc. Works with Epson compatibles and the new Epson laser. Price £29.95.

ST SECRETS

Colm Cox delves into the inner secrets of the ST – beginning with Sound

This is, hopefully, the first of a short series of articles which aim to cover some of the more interesting features of the Atari ST range of computers. In each article I aim to give examples in ST Basic, C and 68000 assembly language – which I hope will make the examples of some use to everyone.

This article covers the subject of sound. It would be of benefit to have a short description of the YM-2149 sound chip used in the ST so I'll start from there. To save space we'll call the chip the PSG from now on.

The PSG has 3 independently programmable tone generators i.e. 3 channels. A noise channel can be mixed with each of the tone channels. The noise channel's pitch is under program control and the tone channel's volume is also under control of a program or 8 hardware volume envelopes.

The PSG has 14 registers which control the tone and noise channels. A description of the registers is given below:

REG 0 and 1: Pitch control of channel 1. This is a 12 bit value with the low 8 bits in REG 0, the high 4 bits in the low 4 bits of REG 1. The lower the overall value the higher the pitch.
REG 2 and 3: Ditto for channel 2.
REG 4 and 5: Ditto for channel 3.
REG 6: Pitch control of noise channel. This is a 5 bit value, and the lower the value the lower the pitch of noise.
REG 7: Mixer control. This register controls the overall Output. Each sound channel can be tone only, noise only or tone and noise. This register controls the combinations. Table 1 gives a description of the use of each bit.
REG 8: The low 4 bits control volume of channel 1 but if bit 4 is set then the volume is controlled by a hardware envelope.
REG 9: Ditto for channel 2.
REG 10: Ditto for channel 3.
REG 11 and 12: The hardware envelope can last a certain amount of time, called the sustain period. This register defines this period.
REG 13: This register defines the shape of the envelope to be used. The envelope in use is global to all channels, but what are the shapes of the hardware envelope? If you look in the ST Basic Source Book, under the command 'WAVE' a list of the envelope shapes is given. What – it isn't there? The early sourcebooks were sent out missing some vital diagrams! For those of us with an early manual, myself included, Figure 1 shows the envelope shapes along with the number to place in REG 13.

So now you know about the registers, how do you access them? It is not possible to access the registers directly but two locations, $FF8800 and $FF8802 are the answer.

$FF8800 WRITE – Register select, store the number of the register you wish to access here.
$FF8800 READ – Read data, after storing the register number here, reading this location will yield the value stored in that register.

$FF8802 WRITE – Store data, after storing the register number in $FF8800 you can write to that register by storing the required value here.
$FF8802 READ – Always returns $FF

Note: The above registers are 8 bit registers.

NOW FOR THE PROGRAMS

Listing 1 is an example of using the above method to program the PSG from ST Basic. For the BASIC programmer there is no need to go to these lengths as ST Basic includes the necessary commands, however the Basic

```
10    REM ***********************************************************************
20    REM *                        ST Secrets series                             *
30    REM *                               by                                     *
40    REM *                            COLM COX                                  *
50    REM * ------------------------------------------------------------------- *
60    REM *               SOUND - ARTICLE ONE - LISTING ONE                      *
70    REM *                          (ST BASIC)                                  *
80    REM *                 PAGE 6 MAGAZINE - ENGLAND                            *
90    REM ***********************************************************************
100   REM
110   REM +---------------------------------+
120   REM !  FIRST SET PITCH ON CHANNEL 1   !
130   REM +---------------------------------+
140   REGISTER=0:VALUE=100:GOSUB SET.SOUND
150   REGISTER=1:VALUE=2:GOSUB SET.SOUND
160   REM +--------------------------------+
170   REM !  NOW SET VOLUME ON CHANNEL 1   !
180   REM +--------------------------------+
190   REGISTER=8:VALUE=15:GOSUB SET.SOUND
200   REM +---------------------------------+
210   REM !  NOW ENABLE TONE ON CHANNEL 1   !
220   REM +---------------------------------+
230   REGISTER=7:VALUE=&HFE:GOSUB SET.SOUND
240   REM +-------------------+
250   REM !  WAIT FOR A BIT   !
260   REM +-------------------+
270   FOR DELAY=1 TO 2000:NEXT DELAY
280   REM +----------------------------------+
290   REM !  NOW DISABLE TONE ON CHANNEL 1   !
300   REM +----------------------------------+
310   REGISTER=7:VALUE=&HFF:GOSUB SET.SOUND
320   END
330   REM
340   REM ***********************************************************************
350   REM ** G.P ROUTINE TO PUT "VALUE" IN PSG REGISTER NUMBER "REGISTER" **
360   REM ***********************************************************************
370   SET.SOUND:DEF SEG=&HFF8800:POKE 0,REGISTER:POKE 2,VALUE
380   DEF SEG=0:RETURN
```

Sourcebook does not give the best description of the commands so the following is a description relating the commands to the explanation of the PSG given above.

SOUND CHANNEL, VOLUME, NOTE, OCTAVE, WAIT – Play the note NOTE, in octave OCTAVE on channel CHANNEL at volume VOLUME and wait for WAIT 50ths of a second before returning control to BASIC. The only bad point of this command is that the large tone range of the PSG is missed out by the fact that SOUND used musical notes only.

WAVE ENABLE, ENVELOPE, SHAPE, PERIOD, WAIT – ENABLE controls the tone and noise output. Its value is stored in REG 7. ENVELOPE enables/disables envelope control of volume on the low 3 bits of channels 1 to 3, a 1 meaning enable envelope control. This parameter is related to REG 8 – REG 10. SHAPE is the shape of the hardware envelope to be employed, and is stored in REG 13. PERIOD is the period of the hardware envelope and is stored in REG 11 and 12. WAIT has the same effect as in the SOUND command.

The only real advantage of accessing the PSG's registers from BASIC is that you can alter the pitch of the noise channel. A subroutine, along with a program which shows how to use it, is given in Listing 2 – called NOISE.PITCH. NOISE.PITCH expects the new pitch to be in a variable called N.P

DOING IT IN ASSEMBLY OR C

For the Assembly and C programmers, the hardware registers are one way of producing exciting sound effects and music with the ST. This section onwards will deal mainly with programming in C and Assembly Language.

Direct access of the hardware registers is not the only way of using the PSG. Atari thoughtfully provided 2 routines in the XBIOS (eXtended Basic Input/Output System), they are: GIACCESS and DOSOUND.

GIACCESS

This routine allows easy access of individual PSG registers. The calling mechanism from Assembly Language is:

```
10    REM ***************************************************************
20    REM *                        ST Secrets series                     *
30    REM *                               by                             *
40    REM *                            COLM COX                          *
50    REM * ------------------------------------------------------------ *
60    REM *                SOUND - ARTICLE ONE - LISTING TWO             *
70    REM *                          (ST BASIC)                          *
80    REM *                  PAGE 6 MAGAZINE - ENGLAND                   *
90    REM ***************************************************************
100   REM
110   REM +----------------------------------+
120   REM !  FIRST SET VOLUME OF CHANNEL 1  !
130   REM +----------------------------------+
140   REGISTER=8:VALUE=15:GOSUB SET.SOUND
150   REM +------------------------------------+
160   REM !  NOW SET PITCH OF NOISE CHANNEL   !
170   REM +------------------------------------+
180   N.P=31:GOSUB NOISE.PITCH
181   REM +------------------------------------+
182   REM !  ENABLE NOISE ONLY ON CHANNEL 1   !
183   REM +------------------------------------+
184   REGISTER=7:VALUE=&HF7:GOSUB SET.SOUND
190   REM +-------------------+
200   REM !  DELAY FOR A BIT  !
210   REM +-------------------+
220   FOR DELAY=1 TO 2000:NEXT DELAY
230   REM +--------------------------------+
240   REM ! THEN INCREASE PITCH RAPIDLY   !
250   REM +--------------------------------+
260   FOR N.P=31 TO 0 STEP -1
270   GOSUB NOISE.PITCH
280   REM +---------------+
290   REM !  SMALL DELAY  !
300   REM +---------------+
310   FOR DELAY=1 TO 20:NEXT DELAY
320   NEXT N.P
330   REM +-------------+
340   REM !  REPEAT IT  !
350   REM +-------------+
360   GOTO 260
29997 REM ***************************************************************
29998 REM **     G.P ROUTINE TO CHANGE PITCH OF NOISE CHANNEL TO N.P     **
29999 REM ***************************************************************
30000 NOISE.PITCH:REGISTER=6:VALUE=N.P:GOSUB SET.SOUND:RETURN
30010 REM
39997 REM ***************************************************************
39998 REM ** G.P ROUTINE TO PUT "VALUE" IN PSG REGISTER NUMBER "REGISTER" **
39999 REM ***************************************************************
40000 SET.SOUND:DEF SEG=&HFF8800:POKE 0,REGISTER:POKE 2,VALUE
40010 DEF SEG=0:RETURN
```

```
;*********************************************************************
;*                        ST Secrets series                          *
;*                               by                                  *
;*                            COLM COX                               *
;* ----------------------------------------------------------------- *
;*             SOUND - ARTICLE ONE - LISTING THREE                   *
;*                     (ASSEMBLY LANGUAGE)                           *
;*                  PAGE 6 MAGAZINE - ENGLAND                        *
;*********************************************************************
giaccess_opcode = 28
dosound_opcode  = 32
xbios_number    = 14
;
; This code has to allow for the fact that  Haba  "C"  treats all arguments as
; long words.  The code given here takes account of that fact.  Also  the fact
; that   Haba  "C"  only allows the use of   D0 , D1 , A0 and A1 is taken into
; account.  If you have a  "normal" C  then use the assembly language  listing
; given in  Listing  4.  This code may work on other nonstandard  "C"'s  -  if
; Listing 4 doesn't work then try this - it may be the answer. Usage of either
; routine is exactly the same.
;

    .text                              ; Text segement - for linkers use.
    .global  _giaccess                 ; giaccess is global so that it may
_giaccess                              ; be linked in with other routines.

    move.l  a2,save_a2                 ; Save A2
    move.l  a6,save_a6                 ;  ''  A6
    move.l  d2,save_d2                 ;  ''  D2
    move.l  sp,save_stack              ;  ''  SP
    addq.l  #4,sp                      ; Skip return address on SP

    move.l  (sp)+,d0                   ; Pop data
    move.l  (sp)+,d1                   ; Pop register#

    move.l  #second_stack.a6           ; Set up a psuedo stack - A6 is s.pointer.
    move.w  d1,-(a6)                   ; Push on register first
    move.w  d0,-(a6)                   ; and then the data.
    move.w  #giaccess_opcode,-(a6)     ; Then the xbios opcode for giaccess.

    move.l  a6,sp                      ; Make real SP = psuedo stack pointer.
    trap    #xbios_number              ; Call xbios.
    move.l  save_stack,sp              ; Restore real SP.

    move.l  save_a6,a6                 ; Restore A6
    move.l  save_a2,a2                 ;    ''     A2
    move.l  save_d2,d2                 ;    ''     D2
    rts

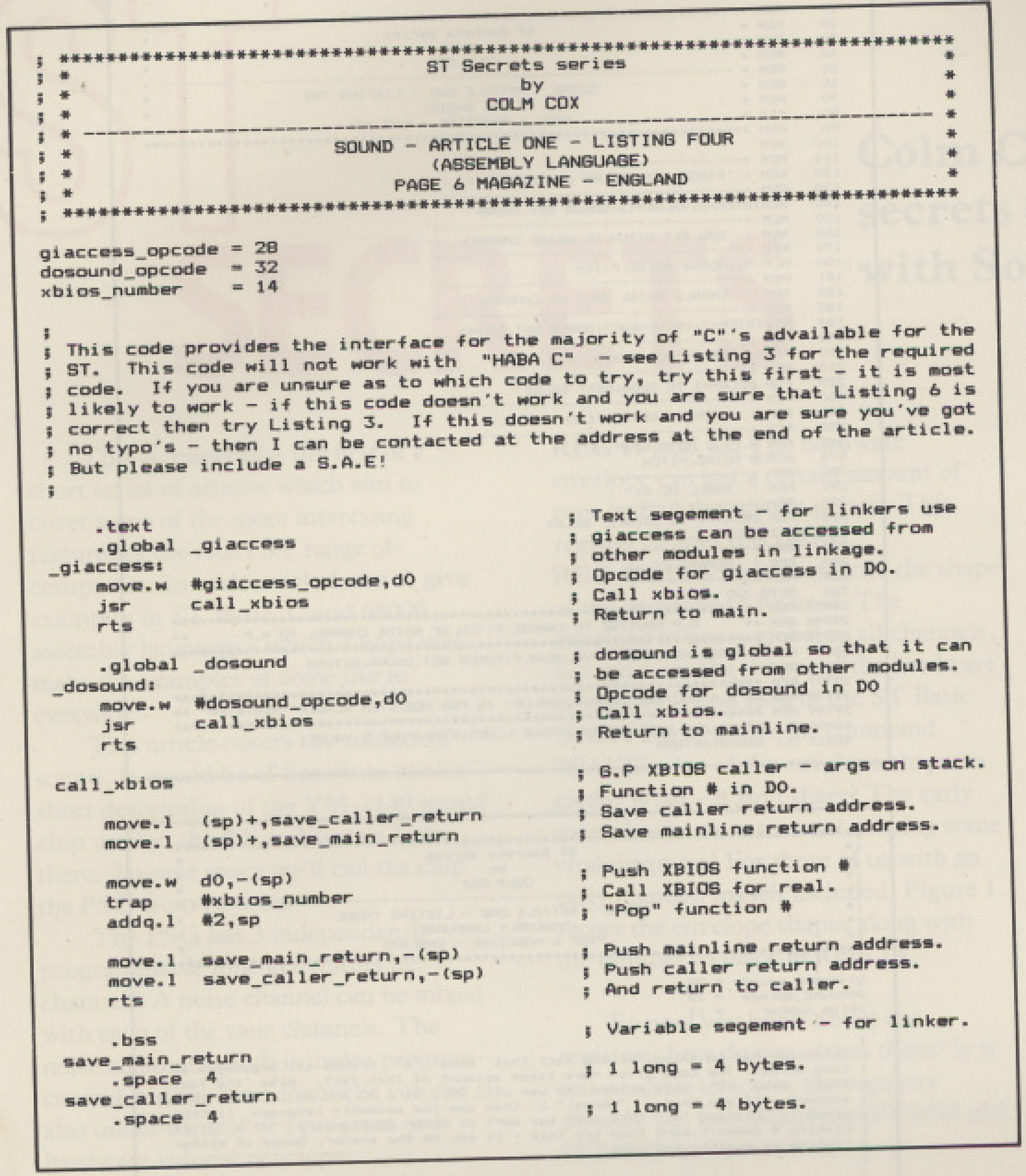
    .global  _dosound                  ; dosound is global so that it may be
_dosound:                              ; used from other "C" routines when linked.
    move.l  a2,save_a2                 ; Save A2 ) Used by XBIOS so we must
    move.l  d2,save_d2                 ;  ''  D2 ) protect these.

    move.l  (sp)+,save_return          ; Pop return address from stack.
    move.w  #dosound_opcode,-(sp)      ; Push on XBIOS opcode for dosound.
    trap    #xbios_number              ; Call XBIOS.
    addq.l  #2,sp                      ; "Pop" XBIOS opcode for dosound.
    move.l  save_return,-(sp)          ; Push return address.

    move.l  save_a2,a2                 ; Restore A2
    move.l  save_d2,d2                 ;   and   D2
    rts

    .bss                               ; Variable segement - for linker's use
save_return
    .space  4
save_stack
    .space  4
save_a6
    .space  4
save_a2
    .space  4
save_d2
    .space  4

    .space  256
second_stack
    .space  256
```



```
; ****************************************************************
; *                     ST Secrets series                        *
; *                            by                                *
; *                         COLM COX                             *
; * ------------------------------------------------------------ *
; *            SOUND - ARTICLE ONE - LISTING FOUR                *
; *                  (ASSEMBLY LANGUAGE)                         *
; *              PAGE 6 MAGAZINE - ENGLAND                       *
; *                                                              *
; ****************************************************************

giacess_opcode  = 28
dosound_opcode  = 32
xbios_number    = 14

;
; This code provides the interface for the majority of "C"'s advailable for the
; ST.  This code will not work with  "HABA C"  - see Listing 3 for the required
; code.  If you are unsure as to which code to try, try this first - it is most
; likely to work - if this code doesn't work and you are sure that Listing 6 is
; correct then try Listing 3.  If this doesn't work and you are sure you've got
; no typo's - then I can be contacted at the address at the end of the article.
; But please include a S.A.E!
;

    .text                               ; Text segement - for linkers use
    .global _giaccess                   ; giaccess can be accessed from
                                        ; other modules in linkage.
_giaccess:
    move.w  #giaccess_opcode,d0         ; Opcode for giaccess in D0.
    jsr     call_xbios                  ; Call xbios.
    rts                                 ; Return to main.

    .global _dosound                    ; dosound is global so that it can
                                        ; be accessed from other modules.
_dosound:
    move.w  #dosound_opcode,d0          ; Opcode for dosound in D0
    jsr     call_xbios                  ; Call xbios.
    rts                                 ; Return to mainline.

                                        ; G.P XBIOS caller - args on stack.
call_xbios                              ; Function # in D0.

    move.l  (sp)+,save_caller_return    ; Save caller return address.
    move.l  (sp)+,save_main_return      ; Save mainline return address.

    move.w  d0,-(sp)                    ; Push XBIOS function #
    trap    #xbios_number               ; Call XBIOS for real.
    addq.l  #2,sp                       ; "Pop" function #

    move.l  save_main_return,-(sp)      ; Push mainline return address.
    move.l  save_caller_return,-(sp)    ; Push caller return address.
    rts                                 ; And return to caller.

    .bss                                ; Variable segement - for linker.
save_main_return
    .space  4                           ; 1 long = 4 bytes.
save_caller_return
    .space  4                           ; 1 long = 4 bytes.
```



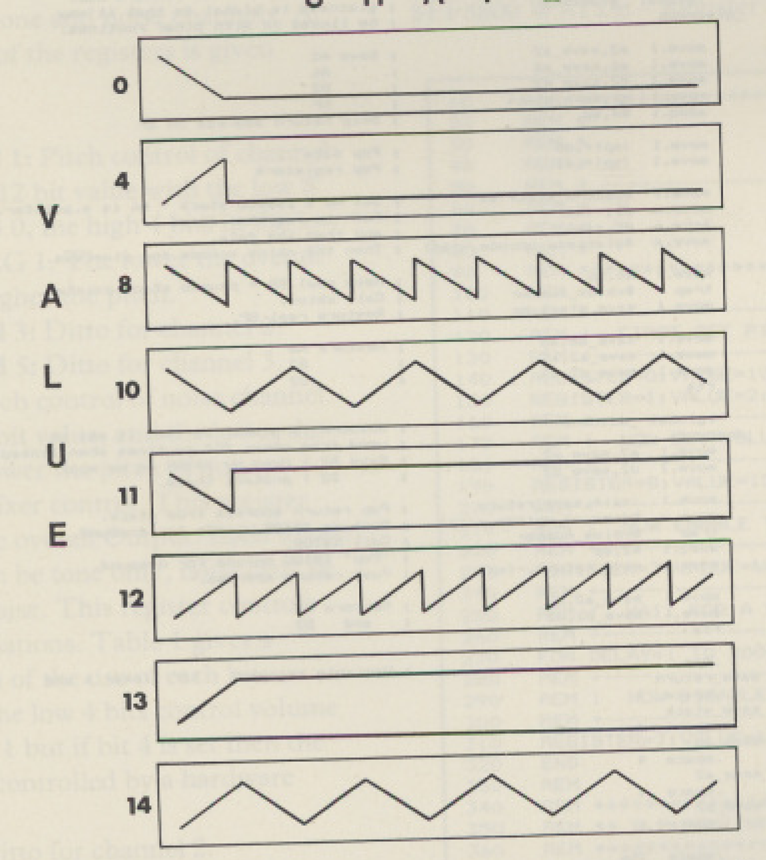


Figure 1 - Hardware Volume Envelope Shapes and value store in Reg 13

```
MOVE.W #REGISTER_NUMBER,-(SP)
MOVE.W #DATA_TO_WRITE,-(SP)
MOVE.W #28,-(SP)
TRAP #14
ADDQ.L #6,SP
```

When writing, REGISTER_NUMBER has the high bit set, when reading REGISTER_NUMBER's high bit is cleared. In the case of read, DATA_TO_WRITE must still be pushed onto the stack. When reading, the value returned is in D0.

DOSOUND

This routine is called 'The Sound Processor', and is a very useful routine. It requires a buffer containing a list of 'sound commands' which are processed by this routine. Calling mechanism from Assembly is:

```
MOVE.L #BUFFER,-(SP)
MOVE.W #32,-(SP)
TRAP #14
ADDQ.L #6,SP

BUFFER
.BYTE 2,10,3,1,7,$3D,8,15,$82,0
```

Each byte in the buffer is either a command or data. Each command requires some data.

$00 – $0F store a value in PSG register. These commands store the next value in the PSG register specified by the command, for example $00,$FF,$01,$EE stores $FF in REG 0 and $EE in REG 1.

$80 stores the next value in a temporary register.

$81 – the first value specifies into which register of the PSG the temporary register will be stored. The second value is a 2's complement value. This value is added to the contents on the register specified above. The last value is the end value – the addition of the second value to the contents of the register will continue until the value in the register reaches this value.

$82 – $FF – if the next value = 0 then control is returned to the main program, otherwise sound processing is halted for the time specified by the next value in 50ths of a second.

Note: It is important to end buffer with a command such as: $82,$00 – which will return control to your program, otherwise the sound processor will continue to process the RAM contents, with some odd effects!

Table 1
Use of each bit in Register 7

Tone Control

Bit 0 – 0 means channel 1 tone on
1 means channel 1 tone off
Bit 1 – 0 means channel 2 tone on
1 means channel 2 tone off
Bit 2 – 0 means channel 3 tone on
1 means channel 3 tone off

Noise Control

Bit 3 – 0 means channel 1 noise on
1 means channel 1 noise off
Bit 4 – 0 means channel 2 noise on
1 means channel 2 noise off
Bit 5 – 0 means channel 3 noise on
1 means channel 3 noise off

THE ASSEMBLY AND C LISTINGS

Listings 3 and 4 are the required Assembly Language interface between C and Assembly Language. Listing 3 is required for HABA C, the C I use, which is in some respects a 'nonstandard' C. Listing 4 is for 'standard' C – the Digital Research C, among others. Either of these listings are required to run Listing 6.

The code is designed to allow it to be used in your own programs. First of all type in and assemble the code specific to your C, then whenever you wish to use one of these routines just type, as the first line of your program:

extern short giaccess(),dosound();

and, at link time make sure you link in the listing for your C.

That's about it for sound, the rest is up to you! Listing 5 is for the Assembly Language programers among us. The amount of code does not justify the end result, but in general the speed of Assembly Language is more than worth the extra effort.

Listing 6 is in C and shows just how fast C can be. Some of the functions in this program may be of some use in your programs. Try changing some of the parameters and try adding your own effect routines – it's very easy!

In the next article I'll be taking the first of two looks at graphics. Don't miss it!

If you have any questions on the article you may write to me, Colm Cox, 10, Graigue Court, Poppintree, Ballymun, DUBLIN 11, Ireland. Please enclose a S.A.E if you want a reply.

```
;*****************************************************************
;*                         ST Secrets series                     *
;*                                by                             *
;*                             COLM COX                          *
;*---------------------------------------------------------------*
;*              SOUND - ARTICLE ONE - LISTING FIVE               *
;*                      (ASSEMBLY LANGUAGE)                      *
;*                  PAGE 6 MAGAZINE - ENGLAND                    *
;*****************************************************************
;
; Sound demo, using XBIOS routines: GIACCESS and DOSOUND
;             using GEMDOS routine: RAWCONIO
;
;*****************************************************************
; EQUATES
;*****************************************************************

XBIOS           = 14    ; Trap number for XBIOS calls
GEMDOS          = 1     ; Trap number for GEMDOS calls
RAWCONIO_OPCODE = 6     ; GEMDOS opcode of RAWCONIO call
GIACCESS_OPCODE = 28    ; XBIOS opcode of GIACCESS call
DOSOUND_OPCODE  = 32    ; XBIOS opcode of DOSOUND call
KEY_PRESSED     = $FF   ; Sub opcode of RAWCONIO, meaning scan keyboard

;*****************************************************************
; MAIN CODE
;*****************************************************************

    .TEXT                          ; For linkers use - Program seg.
    MOVE.L  #SET_UP,A0             ; Set up sound channel 1 for tone only
    JSR     DOSOUND

PITCH_UP
    MOVE.W  #$FFF,PITCH            ; Initalise pitch variable
    JSR     SET_PITCH              ; Store PITCH in hardware reg's

UP_ONE
    JSR     DELAY
    MOVE.W  PITCH,D0
    SUBQ.W  #1,D0                  ; Reduce pitch counter by one
    MOVE.W  D0,PITCH
    CMP.W   #0,D0
    BEQ     PITCH_DOWN             ; Equal to zero?

    JSR     SET_PITCH              ; No - then update hardware pitch
    BRA     UP_ONE                 ; And repeat until pitch=0

PITCH_DOWN                         ; PITCH=0 therefore ramp PITCH upwards
    JSR     SET_PITCH              ; But first update hardware reg's

DOWN_ONE
    JSR     DELAY                  ; Give us time to hear the note
    MOVE.W  PITCH,D0
    ADDQ.L  #1,D0                  ; Increment PITCH
    MOVE.W  D0,PITCH
    CMP.W   #$FFF,D0               ; Equal to $FFF
    BEQ     PITCH_UP               ; Yes then ramp PITCH downwards

    JSR     SET_PITCH              ; No - then update hardware reg's
    BRA     DOWN_ONE               ; And repeat until pitch=$FFF

;*****************************************************************
; SUBROUTINES
;*****************************************************************

DELAY
    MOVE.W  #$100,D6
COUNT_DOWN
    SUBQ.W  #1,D6
    CMP.W   #0,D6
    BNE     COUNT_DOWN
    RTS

;*****************************************************************
;*                                                               *
;* SET_PITCH:- Take a 12 bit value from variable PITCH and store in reg 0&1 *
;*                                                               *
;*****************************************************************

SET_PITCH
    MOVE.W  PITCH,D3               ; Get PITCH as a whole in D3
    CLR.W   D1                     ; Zero Word part of D1
    MOVE.B  D3,D1                  ; Move low 8 bits of pitch into D1
    MOVE.W  #$80,D0                ; And write that value to reg 0
    JSR     GIACCESS               ; of PSG.

    MOVE.W  D3,D1                  ; Get whole of pitch in D1
    LSR.W   #8,D1                  ; Shift bits 15-8 into 7-0 - Leaving high
    MOVE.W  #$81,D0                ; 4 bits in low 4 bits of D1, and then
    JSR     GIACCESS               ; write the result to reg 1 of PSG.

TEST_KEYBOARD                      ; Keyboard testing routine - If any key
    MOVE.W  #KEY_PRESSED,-(SP)     ; is pressed, user wishes to exit.
    MOVE.W  #RAWCONIO_OPCODE,-(SP) ; Uses GEMDOS call RAWCONIO
    TRAP    #GEMDOS
    ADDQ.L  #4,SP

    TST.L   D0                     ; Test result, Equal to Zero?
    BNE     EXIT_PROGRAM           ; No - then exit program
    RTS                            ; Yes - then return to main prog

EXIT_PROGRAM
    ADDQ.L  #4,SP                  ; Not equal to zero - pop unused return
    MOVE.L  #SOUND_OFF,A0          ; address and then switch off sound
    JSR     DOSOUND                ; channel 1.
    RTS                            ; FINISHED!

;*****************************************************************
;*                                                               *
;* GIACCESS:-   D0 contains register number +$80 when operation=WRITE *
;*              D1 contains new value when operation=WRITE      *
;*              D0 contains value returned when operation=READ  *
;*                                                               *
;*****************************************************************

GIACCESS
    MOVE.W  D0,-(SP)
    MOVE.W  D1,-(SP)
    MOVE.W  #GIACCESS_OPCODE,-(SP)
    TRAP    #XBIOS
    ADDQ.L  #6,SP
    RTS

;*****************************************************************
;*                                                               *
;* DOSOUND:-    A0 contains address of buffer holding sound commands *
;*                                                               *
;*****************************************************************

DOSOUND
    MOVE.L  A0,-(SP)
    MOVE.W  #DOSOUND_OPCODE,-(SP)
    TRAP    #XBIOS
    ADDQ.L  #6,SP
    RTS

;*****************************************************************
; DATA
;*****************************************************************

    .EVEN                          ; Align on next even address
    .DATA                          ; For linkers use - Data segement.
SET_UP
    .BYTE   0,255,1,1,8,15,7,$FE,$82,0  ; Setup channel 1, volume 15, tone only
                                        ; storing 255 in reg 0,7 in reg 1

SOUND_OFF
    .BYTE   0,0,1,0,8,0,7,$FF,$82,0     ; Setup channel 1, volume 0, with no
                                        ; sound production and 0 in reg 0&1

;*****************************************************************
; VARIABLES
;*****************************************************************

    .BSS                           ; For linkers use - Variable seg.
PITCH
    .SPACE  4
```

Listing 6 overleaf >

```
/*************************************************************************/
/*                          ST Secrets series                            */
/*                                 by                                    */
/*                              COLM COX                                 */
/* --------------------------------------------------------------------- */
/*                  SOUND - ARTICLE ONE - LISTING SIX                    */
/*                                "C"                                    */
/*                      PAGE 6 MAGAZINE - ENGLAND                        */
/*************************************************************************/

#define WRITE 0x80
#define READ 0

extern short dosound(),giaccess();                  /* Extern and return short. */

char noise_only[]={6,31,7,0xF7,8,0,0x82,0};         /* See article for details  */
char tone_only[]={0,1,1,0,7,0xFE,8,15,0x82,0};      /* of meanings of these     */
char sound_off[]={7,0xFF,0x82,0};                   /* strings of characters.   */

main()
{
     short flag;                                    /* Flag to finish prog, 0 = */
     flag=0;                                        /* continue, 1 = finish.    */

     dosound(noise_only);                           /* Turn on noise channel    */
     lift_off(10);                                  /* Make "lift off" sound    */

     pause(50);                                     /* Wait for a bit           */

     shot(10);                                      /* Gunshot sound            */
     shot(20);                                      /* Long gunshot sound       */

     pause(50);                                     /* Wait for a bit           */

     machine_gun(40);                               /* Fire 40 rounds on m.gun  */

     pause(50);                                     /* Another pause!           */

     dosound(tone_only);                            /* Switch over to tone only */

     while(flag==0)                                 /* In the routine "laser"   */
     {                                              /* a value of zero is       */
          flag=laser();                             /* returned if no key is    */
          pause(40);                                /* pressed and one is retur-*/
     }                                              /* ned when a key is hit    */

     dosound(sound_off);                            /* Key hit - turn off sound */
}

lift_off(length)
short length;
{
     short n_p,n_v,c;

     for(c=0,n_v=10,n_p=31;n_p>11;n_p--)          /* Pitch rises from 31 to 11    */
     {                                             /* While volume rises from 10   */
          giaccess(n_p,WRITE+6);                   /* 15                           */
          giaccess(n_v,WRITE+8);
          pause(length);
          c++;
          if(c==4)
          {
               c=0;
               n_v++;
          }
     }
     for(n_v=15;n_v>=0;n_v--)                      /* Then volume fades from 15 to */
     {                                             /* 0                            */
          giaccess(n_v,WRITE+8);
          pause(length*5);
     }
}

shot(length)
{
     short n_p,n_v;

     for(n_p=10,n_v=15;n_v>=0;n_v--)               /* Pitch is set at 10, while    */
     {                                             /* volume falls from 15 to 0    */
          giaccess(n_p,WRITE+6);
          giaccess(n_v,WRITE+8);
          pause(length);
     }
}

machine_gun(rounds)
short rounds;
{
     short a;

     for(a=0;a<rounds;a++)                         /* Plays ROUNDS number of very  */
          shot(1);                                 /* short shots.                 */
}

laser()
{
     short pitch,flag,a;
     flag=0;

     giaccess(15,WRITE+8);                         /* Volume is static at 15       */

     for(pitch=0x10;pitch<0x400;pitch++)           /* While pitch falls from $10   */
     {                                             /* to $400                      */
          set_pitch(pitch);                        /* Use G.P routine to set pitch */
          a=rawconio(0xFF);                        /* Use GEMDOS rawconio - if your*/
          if(a!=0)                                 /* "C" doesn't have this replace*/
          {                                        /* The line a=rawconio . . with:*/
               flag=1;                             /* a=0 - to exit the program you*/
               break;                              /* will then have to re-boot.   */
          }
     }
     if(flag==0)                                   /* If finished normally then    */
     {                                             /* Fade volume down             */
          for(a=15;a>=0;a--)
          {
               giaccess(a,WRITE+8);
               pause(1);
          }
     }
     return(flag);
}

set_pitch(new_pitch)                      /* G.P routine to change pitch of channel 1 */
short new_pitch;
{
     short high,low;

     low=new_pitch&0xFF;                  /* Divide pitch up into low and high bytes  */
     high=new_pitch>>8;

     giaccess(low,WRITE+0);               /* Then change pitch reg's for channel 1    */
     giaccess(high,WRITE+1);
}

pause(length)                             /* GP routine to pause for a length of time */
short length;
{
     long d;                              /* d must be long as short*100 may > short  */

     for(d=0;d<length*100;d++);
}

/*************************************************************************/
/*                              FINISHED                                 */
/*************************************************************************/
```

M-CACHE
Microdeal
£24.95

Reviewed by Mark Hutchinson

When I read the press adverts about this program I must admit that it did look promising. A cache is used for storing often read sectors, such as the directory. Therefore, instead of waiting for the directory to be read off the disk, it will appear immediately from RAM. Unfortunately it will only work with a hard drive.

The utility is divided into two parts. The first, MCCONFIG.TOS, allows you to decide which of the 14 logical drives to cache. You can divide the hard drive into smaller units for greater protection of data and faster access times (termed partitioning). The cache size can be from 1 to 1024 sectors of 512 bytes each. The setting is saved to M-CACHE.PRG. At this point no verification takes place, so if the disk is write protected, there is no error! I have found this to be a common thing with Michtron programs.

M-CACHE.PRG sets up a cache in RAM, which can only be reclaimed by rebooting. One good point is it will not install itself if it would leave less than 64K. It can be loaded via an AUTO folder and, as the last file, it can be aborted by a key press before it is installed.

Quote, 'How to use M-CACHE – You do nothing!', unquote. This is why it has been split in two. Once you have set the parameters of the cache you need do nothing else, it will flag, store and recall the file from RAM itself. I tried it with the manual for STWRITER (90K) and a smaller (5K) file. It automatically recalled the 90K from RAM, without access to the drive, after the 5K file was loaded.

It works well and I found no strange errors, but does it merit the high price, and would you want it? If I wanted to write an article about programming and disk access, this would be a great choice for the tutorial program. However, £24.95 for this one program, two years old (copyright Michtron 1985), no thank you. If it had been akin to some of the Public Domain collections, and two years ago, I would have jumped at the chance. ●

EASITALK ST
XLent Software
£29.95

Reviewed by John S Davison

A communications desk accessory? Well, why not? If you use your ST for electronic mail or remote database searches its nice to be able to have instant access to comms facilities while using some other GEM based program, such as a spreadsheet or word processor. Even if you don't use electronic mail as such, but just tinker around with bulletin boards Easitalk could be of use to you, as it offers lots of facilities at a reasonable price. You can quickly learn to use the program as it comes with a good quality 46 page instruction manual, most of which is written in tutorial style.

It runs in either medium resolution colour or high resolution monochrome, and offers VT52 terminal emulation for text-only bulletin boards and services, and also PRESTEL viewdata emulation in colour or monochrome. It handles all PRESTEL features except flashing colours and cursor. In monochrome it uses shading to differentiate between PRESTEL colours.

File transfers can be handled using ASCII or the Xmodem protocol. When using Xmodem you have a choice of 128 or 1024 byte blocks and checksum or CRC checking. The instruction manual contains a list and explanation of Xmodem error messages, about the only time I've ever seen this. Full marks, XLEnt!

A 64K capture buffer may be toggled on and off to record incoming and outgoing text as required. Amount of free space remaining is shown in a status display at the bottom of the online screen. The buffer can be saved to disk and cleared when required. Buffer contents can't be viewed directly, but only by saving the buffer to disk then reloading it again, and using the 'local' duplex setting to route the data to the screen. The buffer can't be printed or transmitted either. XLEnt should rework this part of Easitalk to improve the facilities.

Viewdata frames may be saved to disk and reloaded later for reference. A frame may also be printed at any time, either in text-only form or as a screen dump to the printer via the ALT-HELP facility.

Full control over the RS-232 transmission parameters is possible, with baud rate settings from 75 to 19200 (including split rates for PRESTEL), parity, stop bits, word size, duplex, and flow control. It's possible to define and save lists of up to ten services or bulletin boards you use, together with their phone numbers, user-IDs, passwords, and the name of an associated command file. This may then be used for autodialling, auto-logon, or even to fully automate a complete communications session, including retry of engaged numbers at specified time intervals. This means you could let Easitalk collect your electronic mail for you at a specified time, perhaps during off peak periods when phone and connect time charges are lowest.

In summary, Easitalk offers very good value, having facilities only previously available at a much higher price. If you need a versatile low cost communications program this could be the one. ●

LabelMaker
XLEnt Software
£19.95

Reviewed by John S Davison

LabelMaker is a useful desktop accessory providing a quick and easy method of creating, editing and printing labels. It was originally commissioned for use by XLEnt themselves for producing address labels, as no other available software met their needs. You may think £19.95 is a lot to pay for a program to print labels, but much thought has gone into this product to make it really usable.

As it's a desktop accessory it's easy to call up from within other GEM applications (a word processor, for instance). This makes it eminently suitable for printing one-off labels, or even direct printing onto an envelope if your printer will allow it.

Address (or other) labels may be up to six lines long, plus two further lines for additional non-printed data, comments, etc. Labels can be created and saved to disk as single items, or added to the program's integral database. Strangely, you can't delete labels from the database, but this may be done with a separate text editor or word processor. You can have several different databases if you wish. The advantage of the database is that it has useful search facilities, allowing you to retrieve one or a series of labels matching your search criteria. Also, XLEnt claim the database format to be compatible with many other word processor, database, and mailmerge programs, so data could be interchanged between them. Format details are provided in the instruction manual.

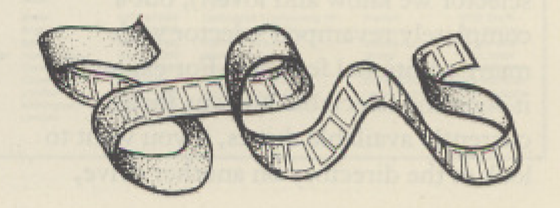
Included in the package is a printer settings desk accessory. This can be used independently of LabelMaker and lets you send appropriate codes to set up your printer to produce a particular style of characters. As supplied the program allows you to choose character pitches from Large, Elite, Small, Tiny, and to use Italic, Bold, and Proportional options. You can also reset the printer, execute a form feed, and toggle 'skip over perforations' and the printer's 'out of paper' detector. They're selected by clicking on buttons in the dialogue box displayed when you invoke LabelMaker.

These default settings are designed to work with an Epson FX80 printer, but a couple of extra tables are included for use with other printers. By using a separate text editor or word processor you can produce your own printer table. This means the buttons may be customised with whatever names you chose, and to produce whatever character styles your printer can handle.

When printing labels you can specify horizontal and vertical positioning, ensuring each address is aligned with your label stationery layout. You can also state the number of copies of each label required. It handles only single strip label sheets, not the type with several labels in rows across each sheet.

The program also has optional print spooling (using memory buffering), allowing label printing to continue while you use the computer for something else.

LabelMaker is a very useful program, made even more useful by being constantly available as a desk accessory. It could soon repay its cost in time saved. ●



Tempus
- the Text Editor
Eidersoft
£29.95

Reviewed by Steve Pedler

Anyone who has programmed his or her ST at all will have used some sort of text editor to enter the program into the computer. Manufacturers of computer languages usually (but not always!) provide some sort of editor with the language package. Why then would any software house expect a programmer to pay £30 on top of the expensive language software when the editor is something you get for free?

Unfortunately, the quality of bundled text editors is not all that high. Software manufacturers are understandably reluctant to expend time and effort on a product which is merely to be given away. Tempus, from the German software house Creative Computer Design is an attempt to combine the best of both worlds, but you will have to dig deep into your pocket for it. Is is worth it?

Tempus comes on one single sided disk plus a comprehensive loose leaf manual in a grey ring binder. The manual is well printed and very thorough and clear in its explanations, screen shots are used where appropriate. The disk is not copy protected, the manufacturers having correctly surmised that no-one would buy a text editor that could not be copied onto other disks. You do have to go through an installation procedure the very first time you use Tempus, but it is quick and easy and it only has to be done the once (in fact you can only do it once as the installation program is deleted after it is run!).

The editor itself is fully GEM-based but has been enormously enhanced in that many of the GEM routines have been rewritten in 68000 assembly language which considerably increases the speed of operation (GEM itself is written in C). On loading the program you are presented with a file selector, not the standard GEM file selector we know and love(!), but a completely revamped selector with many additional features. For example, it contains selectable buttons for all currently available drives, if you want to look at the directory on another drive, just click on the button. There are also a series of buttons to select all the common filename extenders (.C, .DOC. .TXT, .S etc) so you don't have to keep re-typing the directory line of the selector. This is how the GEM file selector should have been written! Two problems with the standard selector have been put right, typing an underscore into the directory line no longer crashes the machine, and the 'action' button (which contains 'OK' on the standard selector) now contains the name of the operation to be performed (Load, Save etc.). You can also pass an argument line containing the name of a file to be loaded when Tempus is run, if you run it from a shell program. The authors say that Tempus is compatible with currently available shell programs although there was apparently a problem with early versions of Metacomco's Menu+ (later versions are OK). I have been using Tempus with Menu+ for some weeks now without difficulty.

'one of the finest pieces of professional software'

File loading and saving has been speeded up – simple tests showed that it took 7 seconds for Tempus to load a 35K file, 18 seconds for Metacomco's ED and 22 seconds for 1st Word. Up to four files may be present in memory simultaneously and the loaded file is displayed in an enhanced GEM window. The title line of the window, in addition to the file name, contains the current line and column numbers that the cursor is in and these are updated when you move the cursor. This makes it very easy to go to any specified line, but more of this later. A major improvement is found in the window arrows and scroll bars. These auto-repeat so that all you do is click on an arrow or scroll bar and hold the button down to scroll through a complete document. Scrolling is incredibly fast – a complete screen of text scrolls smoothly past in under a second.

Tempus contains a full set of facilities for moving around the text more precisely. You can jump to any specified line number, move to top or bottom of the text, or to the beginning or end of a line – all with equal speed and ease. You can also set invisible markers in the text and so move instantly to and fro between different areas of the text – a feature I found to be extremely useful. All the usual block and search/replace facilities are there, and are carried out so quickly as to be virtually instantaneous. The editor can even build a cross-reference list for any specified string. Once the list is built, clicking with the right mouse button on an entry in the list moves the cursor instantly to that line in the main text.

Tempus has many other features, too numerous to discuss in detail here, but I will just mention briefly that it can of course print your text files, that there is an inbuilt programmer's calculator, that a digital clock is displayed at the top of the screen and that it can use alternative fonts designed with DEGAS. The facilities of Tempus are accessed either through drop-down menus or via the function keys, and all facilities are also available from the keyboard using Control-key or Alternate-key combinations. If you use certain text strings frequently these can be assigned to one of the function keys used in conjunction with Shift or Alternate. These and many other customisable features of Tempus can be saved to disk as part of an installation file loaded whenever Tempus is run.

I can only think of one missing feature – there is no facility to automatically change the case of a letter or word on which the cursor is resting, you have to delete and retype it. It would also have been nice to have one or two disk utility features present, such as disk format and file deletion and rename, but this is just nitpicking. There is one small but irritating bug – you cannot get the apostrophe (') from the keyboard! The reason is that the inbuilt clock can be toggled on or off with the Alt-' combination, but the '-key without pressing Alternate has the same effect! All is not lost though because Tempus can display a character table similar to 1st Word, and you can get the apostrophe from that. I can live with this in order to use this amazing program.

Having run out of superlatives, all I can say in conclusion is that if you are at all interested in programming the ST you will find Tempus very useful indeed. Go out and buy what must be one of the finest pieces of professional software available today. It is worth every penny. •

BASE TWO

Published by Antic Publishing, Distributed by Electric Software £59.95

Reviewed by Matthew Jones

Base Two is, according to the press release, an 'elegantly powerful, but easy to use ... database for the Atari ST.' It is intended to be a powerful database without all the complication of a program like Superbase Personal and to this end, it succeeds very successfully.

IN OPERATION – TWOMAKE

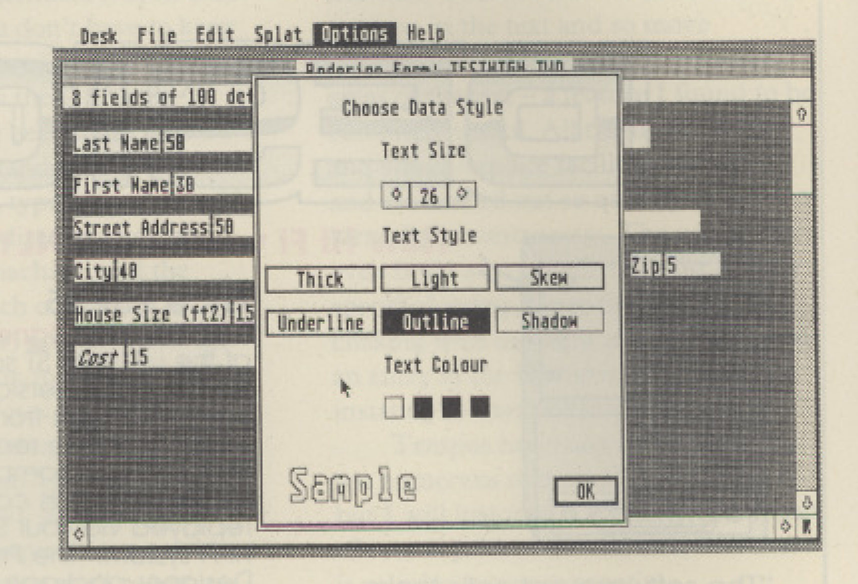
The American version of Base Two, which is the version received for review, comes in a standard A5 ring binder which contains a 65 page manual. A disk in the package contains the software, which includes a database creator program, TWOMAKE, and the database manager program, TWOUSE. A shell program, TWOSHELL, allows switching between the two programs.

Before you can use a database, you must design the layout of the input screen using TWOMAKE. This is done in a very flexible manner, which is becoming standard amongst GEM databases. You are given a blank screen, and can position the fields (for definitions of terms see my previous SuperBase review) by clicking at the desired position with the mouse. Base Two then allows you to give a title of up to 65 characters to each field. You can then use 'sizers' on the data portion of the field, so that it can be up to 99 lines deep, or 73 characters wide (with no title), up to a maximum of 3000 characters per field. A field can also be used without a data area, i.e. just as a text box for its title.

The data type in the fields can be 'implicit' (assumed numeric until a date or text is input), 'alpha', 'numeric' (with number of decimal digits setting) and 'date'. A formula can be added to the field, which is generated in a very logical fashion. A separate window opens for the formula, and you can either type directly in, or you can click on a field in the main design window to reference a field. Thus you could generate a formula for 'total' by choosing Set Formula, then clicking on the 'cost' field, typing '*', then clicking on 'VAT'. Perfectly simple. The drawback is that the only operations that are available are +,-,*,/, and S for square root – but these should be adequate for most purposes.

Also configureable are the height, colour and style of the characters in either the label or data parts of each field. A point of note here is that the standard size character on a monochrome screen will be twice the size when a colour monitor is used. Standard size on a colour monitor will be small on monochrome. To me, this is a drawback, because I frequently switch monitors, and so would suffer from this problem. I understand why the problem occurs, but it can be programmed around – so I consider this a fault.

The maximum number of characters any record can hold is 3000 characters, the maximum number of fields is 100. Base Two keeps all the records in memory at once, so the maximum



'simple to use but also powerful'

number of records depends on how much memory you have, and how full your records are (Base Two compacts the data internally).

An option that has been carried over from the previous version (DB Master One) is the Splat option, which gives standard layouts for mailing lists, checkbooks (sic), collections, and recipes. I do not consider these very useful, except as a learning aid.

A nice part of the new program is that if you decide that you wish to alter the layout of the record, by adding or deleting a new field, or changing a size, is not fatal to the whole file. The data will be rearranged next time you load the file. Another good factor is the use of keyboard alternatives to the most common menus, something that will make it usable in the long term.

THE DATABASE MANAGER – TWOUSE

The actual database manager, TWOUSE, takes a record definition created by TWOMAKE, and allows you to put data in it. Entering data is very simple. You start by clicking in the field you want to start at, then type the data in. Text data is fully word wrapped (on multiple line fields) and cut, copy and paste of blocks are available. Press Return and you move to the next field. When you have gone all the way round, the fields start to invert to indicate that you have been there before (but does not stop you editing further). When you are satisfied, the Control-A key (Add) is pressed (or a menu used) to enter it into the database. You then start again with the next record. As all the data is held in RAM, you should save the data to disk frequently to ensure its safety.

Having added all the record data, you will then want to retrieve it according to certain criteria. Base Two allows you to retrieve data in two basic forms, record format (and edit) and report format. Find All and Find Some allow you to examine the data one record at a time. Find Some allows up to three conditions to be set. These are a set with a window based dialog. You select a field to test with the mouse, then select the condition type – one of 'equals', 'between' and 'contains' – then type the appropriate test data. These are not complicated by

wildcards or case dependencies, if you want all records between 'Jones' and 'Smith', you just type them in and that's what you get. Simplicity is gained at the cost of complete flexibility, but again, this is as much as most people need (and it is still quite flexible), so it is not a drawback. Once you have made the selection, you are shown the first match. The next match is displayed after the Control-N key is pressed, and going backwards is achieved with the Control-B key (but you cannot loop round).

REPORTS

Reports are altogether more flexible. Each Base Two data file can have a selection of reports (up to ten) stored with it (to save redefining them every time they are needed). Base Two reports are all done via one report design sheet. I looked at DB Master One at this point, as I remembered it had more options. Those options were column, page, record and 'mailing list'; all are still possible with the new Base Two report designer because it is now totally free format. After selecting Design New Report, a small window opens with column and line numbers along the top and sides, and you click within it to place a field. You can the select the actual field to appear at that point by clicking in the main record window. Alternatively you can enter text, to provide static comments. Also available are two header lines in which the current page number, time and date can be placed. A separate Report Options dialog allows setting of the record length, paper length and width, margin, printer initialisation string, soft field sides, bottoms and page lengths (allows Base Two to avoid leaving large amounts of white space on the page – when an address has only two lines used of seven, the next field can start on the fourth line), summary only and continuous paper.

Also selectable is the order in which the records will be produced. Up to three sort fields can be specified, with selectable subtotals and new page, and the order can be ascending or descending. Last, but not least, the search parameters are set using the same technique as Find Some. When as much of the definition has been specified as desired, you select Report Print. You will be asked to name the report that you just created (up to 25 characters), and asked to select the device to send it to. The report can be sent either to the screen (a nice windowed display with small characters), the printer, or to disk (suitable for word-processing).

An extra facility is the DIF (Data Interchange Format) output. This is similar to the Report selection, but much more limited. This allows you to send data to another database or spreadsheet, but does not allow importing, so the flow is one way only.

DB MASTER ONE

Base Two has grown from DB Master One, the 'bundled' database that came with early STs. The authors have also written databases on the Macintosh and IBM PC, apparently very powerful ones. I was interested to compare the two ST programs, and amazed by the basic similarity. Only two new menu titles have appeared, one for DIF, and one for HELP (which used to be at the bottom of the menus anyway). The principles of operation are basically the same, but they have been improved all over. Selection dialogs have been tidied up, and I have come across no bugs while I have been using it (DB Master One had many). A new feature is a menu option to set the date and time – useful if you do not have the control panel resident.

THE MANUAL

The manual is very well produced, and while not massive, covers the functions of the program well. If you had the original DB Master One manual you may remember the rather patronising introduction about the Happy Valley School library fire, causing the loss of the catalogue. Fortunately this has been dropped, and the manual is very much more professional. Sections include a tutorial, references for each program, and general information about the database. The only criticism I have is the lack of an index.

PROBLEMS

Base Two is not without problems, but they are minor. During my period of use, I kept accidentally creating fields in reports just at the right hand edge while going for the slider bar and missing. Because they were at the edge of the window they were then hard to spot – until they appeared on the reports. This is not major, and may just happen to me, but the ease of creating new items makes it susceptible to this sort of thing.

As mentioned above, the format created is resolution dependent, and this could be a problem for some people. A minor niggle is that the Escape key does not clear the field you are entering, as I would expect a GEM program to do.

CONCLUSION

My first impression of Base Two was that it was incredibly simple as a database – simple to use and simple in functionality. As I have become more familiar, I know this is wrong: it is simple to use, but also powerful in functionality. Not as powerful as a program like Superbase, but providing everything the average user needs. The only limitation on database size is RAM, and this has to be considered. If you are investigating databases, but believe that others may be too complicated, scrutinise Base Two. It may well be worth it. ●

STRETCH YOUR MIND AS W

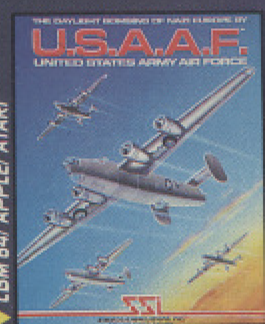
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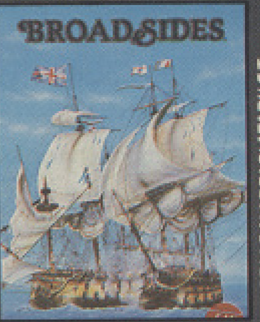
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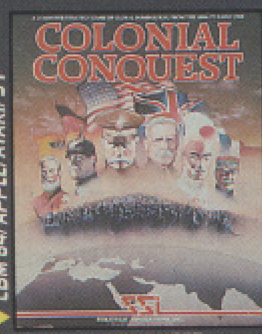
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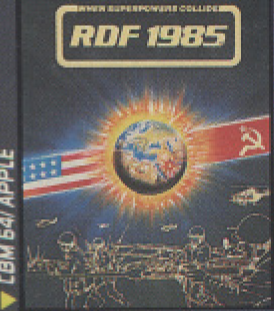
CBM 64/ APPLE/ ATARI

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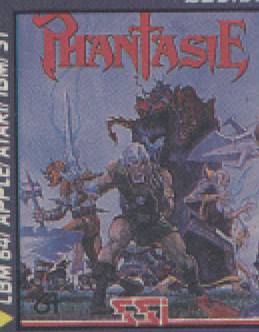
CBM 64/ APPLE/ ATARI/ ST

COLONIAL CONQUEST
This Award Winning Simulation lets you fight for World domination during the Age of Imperialism.
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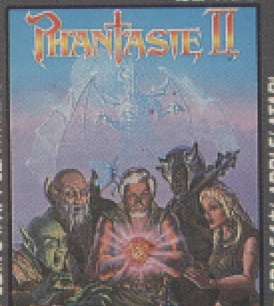
CBM 64/ APPLE

RDF 1985
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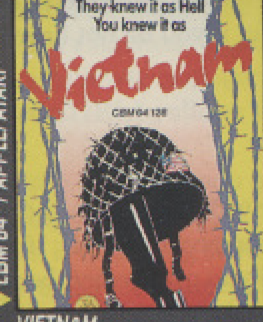
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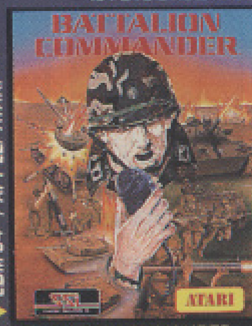
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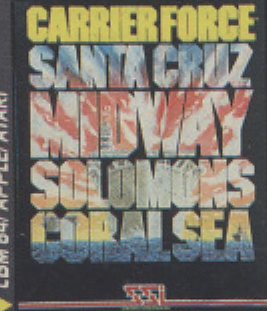
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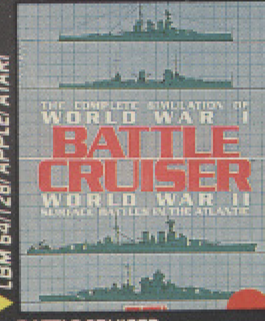
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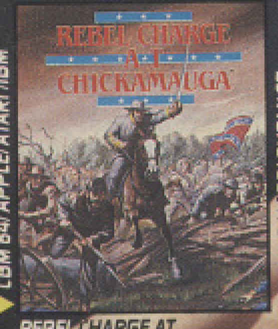
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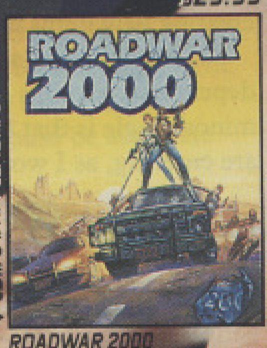
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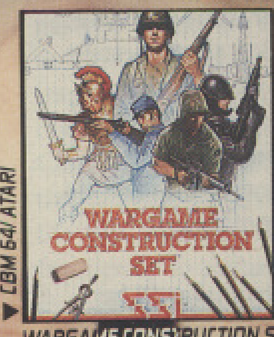
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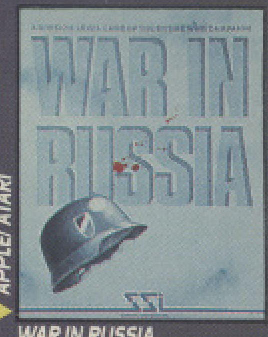
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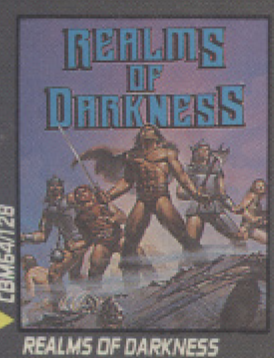
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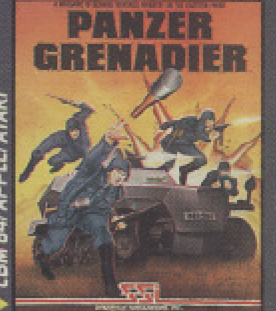
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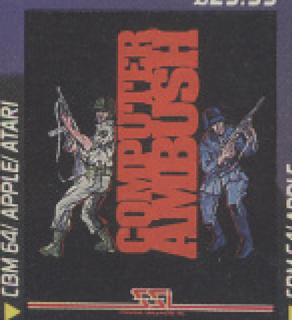
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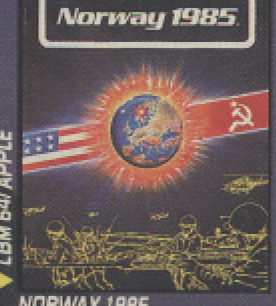
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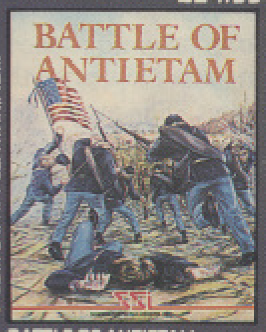
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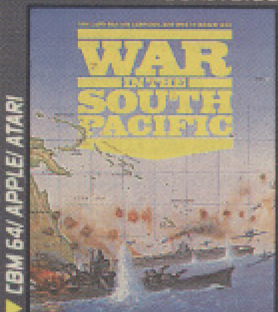
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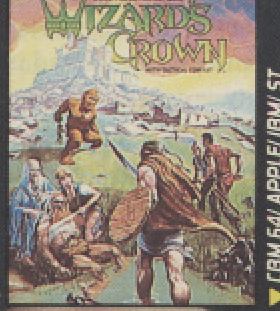
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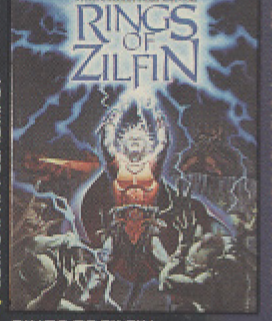
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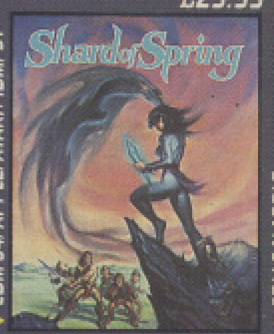
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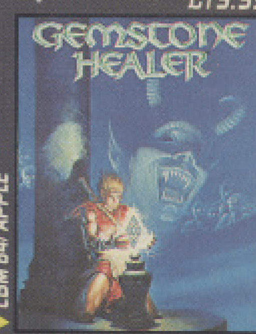
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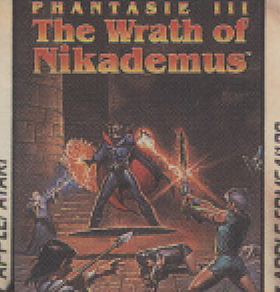
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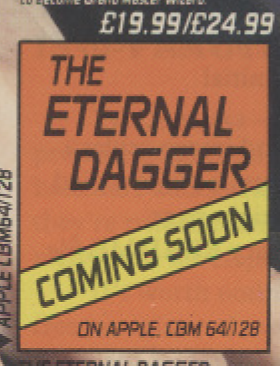
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Hunt the Sorceress for the stolen Shard and bring prosperity back to your island.
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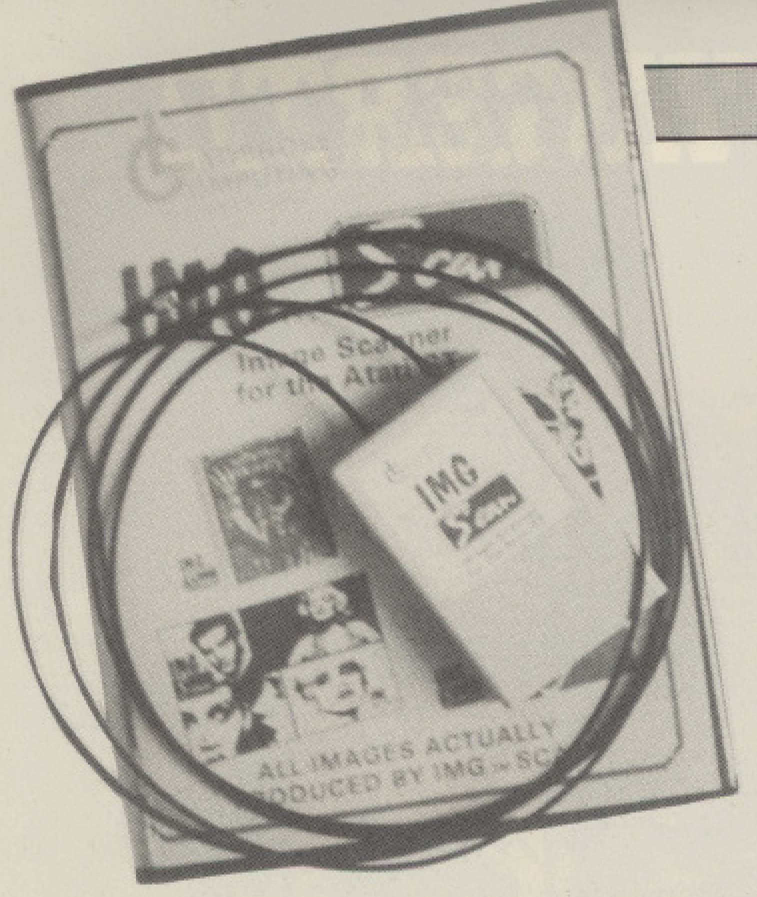


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STRATEGIC SIMULATIONS INC

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IMG SCAN

Ladbroke Computing
£99.99

This has to be one of the most innovative accessories for the ST yet. It's a device for scanning and digitizing images without using an expensive video camera. In fact it's not video based at all, but works on a similar principle to a fax machine. This means IMG Scan can only digitize printed material. It's capable of handling photographs, drawings, pictures from magazines, and similar items.

To achieve this at such a low price the designers obviously had to make compromises. The main one was that they only provide the software and optics of the scanner – YOU have to provide the scanning mechanism. This doesn't mean you need a degree in mechanical engineering, as you may already own the necessary equipment without realising it, your printer!

This isn't as crazy as it sounds, just a product of lateral thinking. Consider this for a moment – a dot matrix printer can reproduce acceptable pictures and graphics by building them up from rows of dots. What if we could reverse this process and cause the print head to become a 'read head', and recreate an existing printed picture as a pattern of pixels in memory? Well, it's now possible – IMG Scan does just that!

In fact IMG Scan goes one better than that. It doesn't simply read dots from the paper – it actually measures and digitizes the image brightness levels at many points along each line. This makes it possible to digitize an image containing varying continuous tones such as those found in photographs.

The only requirement is that your printer should be capable of handling one-time variable form feeds – no problem for most graphics capable dot matrix printers. IMG Scan comes pre-configured for use with Epson compatible printers, but you can easily reconfigure it for your own printer. My Star SG10 worked fine on the Epson setting after some initial experimentation with its DIP switches.

The package includes an ST cartridge and image cable; a disk containing scanning and ancillary software; a photocopied picture for test scanning; and an inadequate eight page instruction booklet (with a small supplementary README file on disk).

THE HARDWARE

Emerging from the cartridge is the 'image cable' – in reality a pair of flexible fibre optic cables each about three feet long. These cables are clipped together at their free ends, with the two exposed fibres constituting the 'read head'. With the cartridge plugged into the ST's cartridge port and the power turned on, a dull red light can be seen shining dimly from the end of one of the cables. Apparently IMG Scan uses infra-red light to illuminate the image it's scanning, with the light source contained in the cartridge. This is good design, as it provides immunity to variation in ambient light levels.

The other cable 'reads' the light reflected from the image and directs it to an infra-red sensor, again located inside the cartridge. Other circuitry must then convert this analogue signal into digital values and feed them to the software for processing and display.

Before using the system you have to remove the printer ribbon and attach the free end of the image cable securely to the print head, with the fibres pointing straight at the paper. The optimum position can be found with help from the scanning program. With white paper in the printer the end of the image cable may be moved back and forth until the lowest possible reading is obtained on a scale displayed on the monitor. You then fix the cable in place.

The main problem here is that Ladbroke provide no means of attaching the cable to the print head, merely suggesting you use sticky tape. With a bit of thought I'm sure they could have provided something better, perhaps based on Velcro pads?

You also have to be careful that the cable can't catch on any of the internal parts of the printer during scanning. Forget this and you could end up with a nasty (and possibly expensive) mess on your hands.

THE SOFTWARE

The disk contains a number of programs, the main ones being those involved in scanning. The scanning program comes in two versions, for high and low resolution displays. The low-res program handles 16 shades of grey and is more advanced than the high-res version, which currently only operates in a simple black/white mode. A new release with grey



A scanner could cost you up to £1000 and although digitisers are more reasonable you still need a video camera. Is there a cheaper alternative? John S Davison finds one that seems to do the job



scale support is promised soon, available free to registered users. I used only the low-res version for this review.

The scanner program is mainly mouse controlled, with keyboard input necessary only when you want to change its basic operating parameters. It has a menu screen and an image display screen, the former containing the system's main controls and the latter used for viewing scanned images.

Before a picture is scanned you have to calibrate the system using the scanner program's 'Auto Grey Adjust' feature. This involves performing a single pass calibration scan across the picture's area of greatest contrast to determine the picture's distribution of grey tones.

A full scan may then be done. With the top of the picture level with the image cable, a click on the 'scan' box causes the menu screen to be replaced by the blank image screen and scanning begins.

The scanning program drives the print head back and forth across the picture. On each left-to-right pass the image cable digitizes a strip of the picture producing up to 320 data points, each set to represent a shade of grey. These are used to plot pixels of the appropriate shade on the screen as the scan progresses. It's fascinating to watch as the picture slowly grows into a recognisable image before your eyes.

After each pass the paper is advanced, the print head returned, and the process repeated. This continues either until you interrupt it or a full screen image (200 lines) has been generated.

Printer and screen scan line widths may be varied independently, so it's possible to 'squeeze' and 'stretch' the image to some extent during the scan. There are also zoom and positioning controls allowing parts of a picture to be picked out and displayed on-screen in different sizes. It takes up to about 6-7 minutes for a complete scan depending on the image size required.

It's possible to interrupt the scan at any point, make the picture lighter or darker, and continue scanning where it left off. In fact, this can be done with completed images too. The program contains clever facilities for adjusting and recalculating the grey scale to produce a contrast range to your liking or to bring out the image's finer detail.

COLOUR IMAGES

IMG Scan digitizes to 16 grey levels, but the ST hardware limits you to displaying only eight of them. This is achieved by pairing levels, which results in loss of image detail. To retrieve the detail you can use shades other than grey. In fact, you don't have to use grey shades at all as it's possible use colours instead. By assigning a colour to each of the 16 grey levels via on-screen RGB sliders you can achieve up to 16 different colours. It's not the same as a true colour scan, of course, but with care and the right subject you can produce pleasing results. The disk contains several examples in grey shades and colour, showing just how impressive the results can be.

The completed image may be saved to disk as raw data, or in DEGAS or NEOCHROME format. This opens up the possibility of further editing and embellishment using those programs. It also gives compatibility with many other graphics oriented utilities now available – including desktop publishing systems. So at last there's a low cost method of getting digitized photographs into your publications!

The disk also contains a utility called AIM, designed to improve clarity, extract features and add special effects to scanned images according to the README file. There were no instructions whatsoever for using it, and my attempt to load it was greeted with a message saying it needed more than the available 512K to run in. Pity, it sounds interesting.

Other software on the disk includes a utility to convert image data into AIM format and back again, and one to convert image or AIM files to POSTSCRIPT format for printing on a suitably equipped laser printer. There's also a simple 'picture show' program for displaying the three sample images provided.

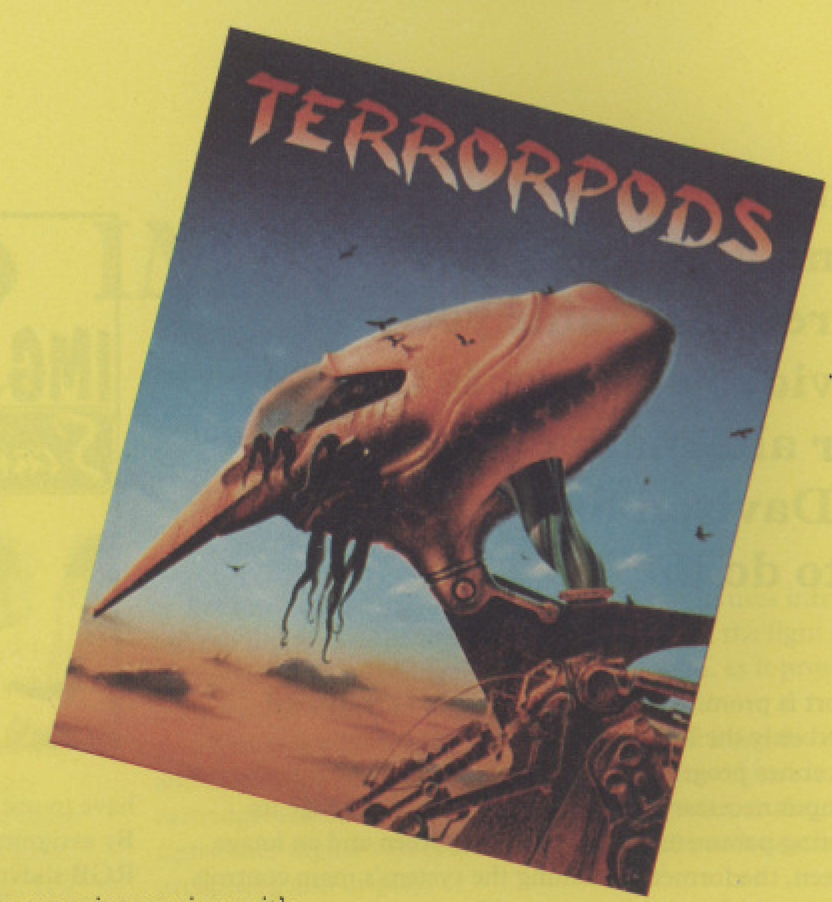
IS IT PRACTICAL?

Yes, it works – and surprisingly well. It takes practice to produce good results, but it's well worth the effort. The basic hardware and software does everything Ladbroke claim, and if they're true to their word there's even better to follow as the software is developed further.

It's worth noting that all software updates will be available free to registered users, a very enlightened and welcome approach by Ladbroke.

One thing they really must do is produce a decent instruction manual – talk about spoiling the ship for a ha'porth of tar! And a quick and effective method of attaching the image cable to the print head is desperately needed too.

These are minor niggles though and if you need an inexpensive method of getting digitized pictures into your ST then this is it.



TERRORPODS
Psygnosis
£24.95

Reviewed by John Davison jnr

'It's been a long watch ... as the sun disappears over the horizon, the uninviting grey bleakness of Colian becomes apparent. Following the intense heat of the day, the onset of night adds the bitterness of sub-zero temperatures to an already hostile environment, and the stark interior of the D.S.V. appears almost homelike.

Deep melancholy is suddenly smashed by the shrill scream of a siren. The information display systems have gone crazy, an extraordinary array of lights flash uncontrollably. Good grief ... What's happening?

Your whole being freezes ... It can't be! The Terrorpods ...'

So starts the latest release from Psygnosis, originally announced at the same time as the brilliant 'Barbarian' which convinced me that Psygnosis finally had it sussed. Does Terrorpods come up to expectations?

The packaging, as always with Psygnosis games is absolutely superb. The glossy box contains the two program disks, a poster (yet another piece of Roger Dean artwork) and an instruction sheet. The scenario of Terrorpods is not as complicated as that of 'Barbarian', so this time we are not treated to a novella. Instead you have to make do with the rather difficult to handle instruction sheet. Why is it difficult to handle? Well for a start it's rather vague and incomprehensible in some areas. Secondly it's enormous, measuring two feet by one foot when fully opened out. This tends to get in the way a bit if you have suddenly forgotten how to do something at a vital moment!

On loading the game you are presented with an animated title sequence involving a little guy leaping out of some sort of vehicle and into the cockpit of a Terrorpod which is leaning over. The cockpit of the Terrorpod then closes and the huge mechanical beast straightens up to his full height. A loud thunderbolt (sampled sound) causes the screen to go white and then fade out revealing a second title screen showing the picture from the box cover. This screen is not as impressive as it's counterpart in 'Barbarian', but it's still a good picture. This screen soon fades out returning you to the animated sequence as you are prompted to insert disk B. Very slick and impressive ... what will disk B bring?

When the game finally loads you are asked to select your nationality. Why you have the choice between American and English as well as the other languages I don't know. What's the difference? The game screen is surrounded by instrument panels in shades of red and orange. The various instruments show the amounts of fuel and various minerals required for functions such as shields and weapons systems. The majority of the screen is taken up by your outside view of the planet Colian. This view consists mainly of a gradually shaded grey ground, and some excellently drawn grey mountains on the horizon. Dotted around on the ground are various mining installations and depots which you will have to visit on trading missions later on in the game. In the sky looms the large Terrorpod space craft, which is also drawn in various shades of red.

Movement around the planet inside your D.S.V. is best controlled with the joystick, and weapons are fired using the mouse. The keyboard is used for selecting various functions such as communications, trading and the different types of weapons (either photons or missiles). The game contains some amazing sound effects, especially connected with these weapons. When a photon is fired there is an excellent sampled sound followed by a loud sampled explosion. All of the sound effects are digitized samples in fact and they add greatly to the game.

So far it would seem that Terrorpods is, after all, merely a demonstration of Psygnosis' ability in the graphics and sound department. Indeed they are excellent, but it seems to me that the actual game has been given second priority, and not as much thought has gone into it as the cosmetic features. Terrorpods, however impressive it may look and sound, is merely an elaborate shoot 'em up game.

Reading through the instructions and the blurb that comes with the game, Terrorpods sounds like it ought to be a really complex, imaginative and interesting game, however, after playing it for quite a while, I couldn't help feeling that the game is very 'thin' in it's content. It always seems that there should be more to it, but there isn't. Your main aim would appear to be to destroy as many Terrorpods as possible using the missiles, and if you run out of resources you have to send your little 'drover' out to trade with one of the various installations. That however, would appear to be all there is to it. This is a shame really, because the graphics and sound are superb, and the theme of the game sounded very good. It just seems that the game is a mediocre implementation of the plot.

Don't get me wrong, Terrorpods is not a bad game, but I feel that it could have been better than it is. ●

MISSION ELEVATOR
Eurogold/Starline Distributed by Ariolasoft
£19.99

Reviewed by John Davison jnr



Foreign secret agents have hidden a time bomb in a big hotel. The bomb is hidden somewhere on the sixty second floor. It is your job, playing the part of agent Trevor, to enter the building on the ground floor and work your way up, collecting clues and hints to crack the code.

I have a feeling that this is similar to the arcade game 'Elevator Action', which was popular in America but rarely seen in this country. The game is, however, very playable and quite addictive. The screen layout is similar to most platform games, with various floors above you with enemy agents roaming about dressed in long black raincoats and their wide brimmed hats. Between the floors are elevators, which must be used to reach higher floors. On each floor of the hotel there are various doors which can be opened with the key from reception, and other things such as clocks, tables, plants or statues.

The various doors each have someone behind them, be it an enemy agent or a punk rocker! Appropriate digitized sounds accompany some people as they appear at the doorway, for example, when the Nun answers the door, she is accompanied by a church organ! Behind one of the doors you should find the porter who will give you the emergency door key. The hotel is split into eight levels each containing eight floors, and to move onto the following level you must go through the emergency door, using the key obtained from the porter.

The whole game appears quite simple at first, but if you set out to retrieve all of the hints and tips it can become quite complex. Having a notebook handy might be necessary as you get more involved with it. You can obtain hints from various places throughout the game. My favourite is in the bar, where if you buy the correct drink from the barkeeper, he will give you part of the secret code, however you become drunk and the game's controls are reversed. If you try to do any more than move, you are informed that "you are shtill drunk"!

My only dislike of the game is the 'computer printout' which slowly comes up on the screen informing you that you have failed. It then clears the screen and prints another message. This becomes very tedious after a few times, and there is no way of skipping the section. If you get to a point where you have suddenly worked out how to do something and you are then killed off before being able to do so, you normally want to go straight back to the game. You probably won't want to hang around for some silly cosmetic feature to repeat itself yet again.

Other than this minor quibble there is nothing else I can say against the game. The graphics are fairly good, and the sound effects are equally pleasing. Overall I think that Mission Elevator is a game where the programmers have taken a little more care – and it shows!

BACKLASH
Novagen
£19.95

Previewed by John Davison jnr

At the PCW show, Novagen software announced two titles – Damocles, the much awaited sequel to Mercenary, and an ST only game entitled 'Backlash'. At the show, Backlash attracted a lot of attention with its superb graphics and immense speed. Although the game is not out at the time of writing, preview copies were available for review. I doubt very much if this version includes all of the features of the final version, but I would imagine that it is pretty close.

Backlash has been described by some as the sequel to Encounter, the Battlezone type game which Novagen released on the eight bit computers many years ago. However, although the screen layout and controlling methods are the same, Backlash is most definitely much more of a 'blaster' than its predecessor. The screen consists of light grey ground and blue sky. On the ground at regular intervals there are small round grey shadows which help to give the impression of movement when there is nothing else on the screen. In the centre of the screen there is a 'heads up display' which is both your aim sight and a form of radar. The various aliens come in all shapes and sizes and each is very well drawn and extremely smoothly and quickly animated. The fireballs which are fired by both you and your adversaries all cast shadows as do the enemy craft. Upon destroying anything it explodes into many spinning pieces which fly outwards at great speed. Each of these pieces cast a shadow as well! As you can imagine, the screen does get rather full at times!!! However the action is not slowed at all by the immense number of animated objects.

'a smash hit'

Unlike most games Backlash does not have any form of real plot. The game description merely states: 1. This is a fast action arcade game. 2. Objective is high score. 3. Radar/Sights head up display shows enemy locations. 4. Action is continuous with increasing difficulty. 5. Five lives to start. Extra life awarded for every 10, 000 points.

Overall Backlash looks very impressive, however I think that it is a little boring to play at the moment. This is because you do not really have anything to strive for, such as higher levels, only a larger score. It could also do with a little more variety, such as bigger space craft to chase after, or a 'warp' section as in the original Encounter. However, I hear that the finished game will be 450k squeezed onto a single sided disk! So, I imagine we can expect many more features in the final version. When the game is eventually released, I have no doubts that it will become a smash hit.

DEATHSTRIKE
Talent
£14.95

Reviewed by John Davison jnr

It had to happen eventually didn't it? A version of 'Scramble' was bound to turn up at some time. Deathstrike is Talent software's first attempt at an arcade style game on the ST, and let's hope that any others they plan on doing are better than this!

The game loads with a fairly mediocre picture and some extremely boring music, which is on a par with the music on early Paradox/ Eidersoft games such as Warzone (i.e. awful). You are then given the opportunity to turn off the music (which I would imagine you will find an essential thing to do, as it drove me crackers after a while!) or to turn off the sound effects, or both. You then press the joystick button to begin the game.

The scrolling is one point about Deathstrike which I like, it is smooth, and the area of screen which scrolls is quite large, unlike many games which I could mention. The graphics of the mountains are flat and uninteresting being in only one or two colours which gives the screen a very dull look. The various things on the ground such as fuel dumps and missiles are fairly boring and colourless, and are not that well drawn. The sprites are smoothly animated, and your space ship is reasonably detailed, being a grey craft with a large rocket engine at the rear.

Deathstrike has no new ideas at all, it is merely a straight conversion of Scramble, involving just bombing things on the ground, shooting missiles and destroying fuel installations when fuel is required. So overall, all I can say is if you like Scramble then you might like this, but personally I think that the game is uninspired and boring. It is yet another game which does not stretch the ST at all. The programmers have obviously not tried to take advantage of the ST's superior graphics. Unless you feel you desperately need a Scramble clone (which I would imagine is highly unlikely) I am afraid that this is yet another game I cannot recommend. ●

AIRBALL CONSTRUCTION KIT
Microdeal
£19.95

Reviewed by John Davison jnr

After the enormous success of the original game, author Eddie Scio and graphic artist Pete Lyon have got together to produce an extremely comprehensive game creator, enabling you to create your own customized versions of the classic game.

Inside the fairly large box you will find a short but helpful manual and the single Airball Construction Kit disk. Included on the disk are two programs, the game designer, and a customized version of the original Airball game.

The designer program is GEM based with several pull down menus at the top of the screen with options to edit objects and various other details. You can also examine rooms which have already been created. The whole thing seems rather daunting at first however, once you have got the hang of the many functions and options, the program is quite simple to use and you will soon be knocking out versions of Airball in no time!

The graphics, as in the original game, are very impressive and once you have filled a room with objects the screens begin to look really quite professional. The editor is very comprehensive and powerful, not only using the pull down menus, but also several keyboard commands to scroll through the hundreds of different objects at your disposal. All of the details of the original game are available to you, including the different statues, the skeletons, coffins, snakes, candles, trees and many others. They're all there, and only a few keystrokes away.

The manual suggests customizing the game which comes on the disk before progressing with any ambitious projects of your own. Having changed this version, you can place the vital objects anywhere you like in order to make the game as difficult or as easy as you please.

Overall I think that the Airball Construction Kit is absolutely superb, and it is great value for money at a price of £19.95. If you liked the original game, and you are feeling creative, then I would imagine that you will thoroughly enjoy using this excellent piece of software. It is definitely one of the better releases to be made available for the ST in recent months. ●

SKULLDIGGERY
Nexus
£19.95

Reviewed by John Davison jnr

SkullDiggery is basically a version of the old classic 'Boulderdash' and it isn't exactly the greatest game ever to be released for the ST. In SkullDiggery you take the part of a 'bouncy cave mite' who has an appetite for treasure. You must run around the one hundred caves eating the treasure and avoiding the tumbling skulls, the crazy ghosts and the vicious bats.

The graphics are not very good at all. For a start they are medium resolution, giving only four colours and the gain in resolution does not make up for the lack of colour because Skulldiggery looks more like a Spectrum game than an ST game! The graphics are boring and dull, and the scrolling is the worst I have ever seen. It is worse, in fact than the scrolling on Gauntlet (and that was awful). The sound is NOT brilliant during the actual playing of the game, however, when you finish a level and pass through the door to the next level there is a sampled effect of a large door creaking open. On the high score table there is also a sampled sound. I think it's supposed to be a short burst of an electric guitar, but again it is not very good, and it appears to have been put in as an afterthought.

Other annoying little 'features' include the protection which causes the disk drive to spin continuously and becomes very irritating. The only saving grace of the game would appear to be the simultaneous two player option where both players race around either helping or hindering each other getting the treasure. This does not make up, however, for the poor quality of the game. For what it is I think that 'SkullDiggery' is horrendously overpriced and I would steer clear of it. ●

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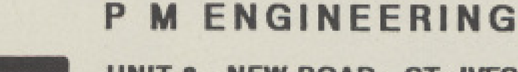
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BUBBLE GHOST
ERE Informatique
£19.95

Reviewed by John Davison jnr

A small ghost in an old castle floats from room to room atop his soul, which is as light and fragile as a soap-bubble. If nothing can block the path of the ghost, the same cannot be said of the bubble, which bursts all too easily!

This is another game from the French company ERE Informatique. From loading up this game, you can tell that it is something a little different to anything else available for the ST at the moment. It could be described as an arcade adventure, but it is something more than that. You play the part of the ghost, who has the task of moving the bubble around the many rooms of the castle.

The game loads with a fairly impressive picture, and a digitized voice welcomes you to Bubble Ghost. The game begins with you floating in a fairly empty room, with the soap bubble hovering in front of you. In the far wall is a doorway, through which the bubble must be blown. Moving the mouse about moves your ghost around fairly quickly, and pushing one of the shift keys on the keyboard causes him to purse his lips and blow. If you are behind the bubble, this will cause it to drift off in the direction you blew it. Your ghost can be rotated left or right using the mouse buttons, because in later rooms you will have to negotiate some quite difficult obstacles such as green heads and large spikes! Normally the ghost is facing the left hand side of the screen so rotation is necessary. To blow the bubble towards the right hand side of the screen, you must turn your little ghost totally upside down! There are lots of nice features in Bubble Ghost, my favourite being the way the ghost goes red when he's been blowing too long. This all seems a bit 'cute' but it is nice to see that the author has put a little thought into the game.



The graphics in the game start off looking a bit bland, however they improve from screen to screen. Shading is used to a good effect, and all of the screens are bright and colourful. The sound effects are also fairly good. The sound of your blowing is very lifelike but I do not care much for some of the 'droning' background sound effects which become a little irritating after a while.

This game came out of the blue with none of the usual pre-release advertising and so I didn't really know what to expect. However, I now think that it's an excellent game and my opinion of Ere Informatique has been given quite a boost because of it.

Bubble Ghost is a refreshing change from a lot of the run of the mill arcade adventures which are being released by the dozen for the ST at the moment. It would appear that a lot of thought and care has gone into the creation of this game. I highly recommend it.

SPACEPORT
Reline
Distributed by Ariolasoft
£19.99

Reviewed by John Davison jnr

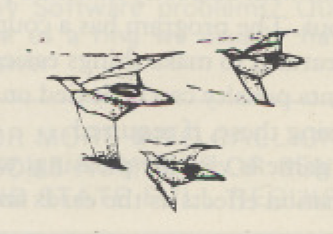
Yet another of those games that had to turn up eventually. This time it's a version of the old classic 'Fort Apocalypse' which was released on various eight bit formats years and years ago.

For those of you who aren't quite sure what I'm on about, the basic plot of Spaceport is to fly your space chopper down underground and rescue the trapped engineering staff. Your space chopper is armed with 'Diverse optics type 2 medium lasers' and a 'Benz-Yamaha Plasma mine generator' to help you overcome the various nasties floating about. In the caverns you will find all sorts of obstacles which must be navigated in order to reach your objective.



To be quite honest, I did not like Spaceport at all. The game screen is much too small, being only a relatively tiny square in the centre of the screen into which the mediocre graphics and sprites go. The scrolling is pretty feeble and the rotor blades on your chopper don't even look as if they're going round! As you move around the underground chambers the graphics of the various nasties, rocks and vegetation do not improve at all, and the little men running around on the landing pads are only several pixels high and look like little matchstick men complete with bright red heads! The sound effects are few and pathetic and the tune on the title screen starts off seeming as though it could be quite good, but once it gets going it's awful.

When the game is running, anyone who didn't know better would probably be very surprised to find the game was running on an ST. This is the sort of thing which puts people off the ST. There are far too many games coming out which are of an unacceptably low standard. The ST would appear to be the 'in' machine with software companies, with them all scrambling to release *something*. In this mad dash to produce a product, the quality seems to be forgotten and games are released which do the ST no justice whatsoever.



Perfect Match
Microdeal
£19.95

Reviewed by John S Davison

There aren't too many educational programs around for the ST so it's good to see this one from Microdeal. Perfect Match is a computerised version of 'Pelmanism', combining memory training and knowledge testing in one enjoyable game.

The disk contains 10 sets of 24 questions and answers in different subject categories, such as science, geography, sport, etc. Three of them cover biblical subjects, which could put some people off. At the start of a game you can elect to use a single category or take items chosen randomly from them all.

The computer then chooses 12 question/answer pairs from the selected category. A question and its matching answer are on separate cards, giving 24 cards in all. The computer shuffles these and deals them face down on the screen. You then have to find and match the question cards with their corresponding answer cards – and it's not as easy as it sounds!

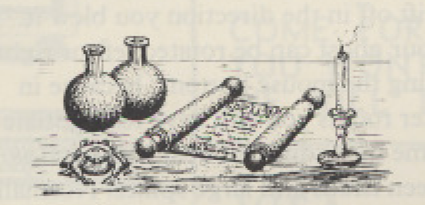
One or two players can take part, each taking turns at finding matching pairs by selecting cards with the mouse. Selected cards flip over and their text shoots out into windows on the left of the screen. This reveals a question and an answer, or two questions, or two answers depending on how skillful (or lucky!) you've been. You have to say whether the pair match or not, i.e. if it's a question with its CORRECT answer. It's possible for a question to be displayed with an incorrect answer, so you have to be careful. This juxtaposition sometimes produces amusing results, adding a touch of humour to the game.

Points are scored depending on your answer to the match/no-match question, with 100, 10 or minus 10 awarded according to how well you do. After answering, the text zooms back onto the cards and they're flipped face down again with correctly matched pairs blanked out. The program has a couple of Help features to make things easier, and a points penalty can be levied on players using these, if required.

The game is visually pleasing, with neat animation effects as the cards are dealt and turned over. Sound is adequate, being limited to card shuffling, dealing and flipping noises, a short fanfare when you correctly identify a pair and odd bleeps and blurps when you don't.

When tired of the supplied categories you can make your own using the supplied cardmaker program. This makes it of general educational interest as you can set questions on any subject at the appropriate level of difficulty. It's a pity you can't use fewer than 24 cards or use simple graphical shapes on them, as this would make the program suitable for young children too.

Overall, I liked Perfect Match. Whether used for educational purposes or just something different from the usual shoot-em-ups I think you'll enjoy it too. •



King's Quest III – To Heir is Human
Sierra
£24.99

Reviewed by John Sweeney

Sierra have been making adventures for a long time – they produced such classics as 'Ulysses and the Golden Fleece' and the 'Wizard and the Princess' back in the early days of adventures. Since then they, like Infocom and others, have devoted a lot of effort to improving their games, taking advantage of more powerful machines, and making the games better and better. They have, however, enhanced their games in a different way to most companies. While the rest of the world devotes itself to producing bigger and better parsers, Sierra have been happy to stick with their primitive, but quite adequate, parser. What Sierra have done instead is concentrate on producing true GRAPHICS adventures or, as they like to call them, 3-D Animated Adventure Games.

Sierra take full advantage of the ST's capabilities to produce excellent pictures of the locations AND you have to move your character around the screen to interact with them. If you want to GET DUSTER from the top of the safe you have to walk across to the safe, if you want to walk down the path from the castle you have to manoeuvre your character, Gwydion, along the narrow trail, arcade-style, going in front of and behind various boulders some of which obscure your view of the route! They have also implemented numerous animated sequences in responise to your commands. So, if you type LOOK UNDER BED in your bedroom then Gwydion gets down on hands and knees and looks under the bed! If you walk past a mirror your reflection can be seen doing likewise. If the wizard catches you shirking your duties he may punish you by making you do exercises: Gwydion does the exercises on screen for you!

The graphics are used to provide many of the problems in the game as well. One screen, for example, is a cliff face honeycombed with caves – you have to steer Gwydion carefully up and down the faces and through the caves.

Lot's of people compare companies like Magnetic Scrolls and Infocom, and talk about Graphics Adventures and Text Adventures. They are wrong. Those are all Text Adventures, either with or without pictures. This is a TRUE Graphics Adventure.

The first part of the game consists of exploring the Wizard's house and the land around it, finding various spell ingredients, avoiding all the deadly inhabitants,and mixing all the spells without the Wizard finding out what you are doing. Both the ingredients and the formulae for the spells are documented in the instruction manual in exquisite detail – "add two drops of toad spittle"! Once you have all the spells you must destroy the Wizard and find a ship to take you back to Daventry, the location of King's Quest (I). Unfortunately the land has fallen into disrepair under the rule of a terrible dragon which has captured the Princess – you'll never guess what your next job is!

The game is not always completely logical and I found some of the scaling slightly misleading – some of the furniture should be shown as rather shorter, and the eagle should be drawn a lot bigger. The box says "The most fun you'll ever have playing Adventure Games". They're right! The King's Quest series may not be as deep or as complex as some of the other offerings on the market, but they are definitely fun. And without doubt King's Quest III is the best yet.

Highly recommended! •

"In the year 2000, bacteriological warfare has ripped apart the very fabric of American civilisation. Cities have turned into gangland prizes, the highways into battlefields."

ROADWAR 2000

John Sweeney concludes his look at two similar games – last issue he tackled Autoduel

The screen fills with a small portion of a map of North America. Your gang is represented by a car in the middle of the screen (the complete map is the instruction booklet). You press G to check out your gang's status and discover that you have one hardtop sports car manned by an Armsmaster and seven Bodyguards, enough food to last four days and enough fuel to travel nine squares. To survive in this frightening future you will need more men, more food and gas, guns, ammunition and antitoxin, not to mention more vehicles to carry them all!

Your prime options are C(ity) to find out who's running your current location, V(ehicle) to try and find more transport to commandeer, L(oot) to search for supplies, and P(eople) to gain recruits, special supplies such as antitoxin from special people such as healers and, most important, clues about your quest. Unfortunately the people running the city will almost certainly object to virtually all of these activities if they catch you at it! Their objections will normally take the form of an attack. In this kind of fight you play no part – just sit back and watch the results flash up on the screen.

Your sole objective at this point in time is survival! Apart from the bacteriological war which has being going on, someone has been dropping nuclear bombs on the major cities so life is neither easy nor pleasant. If the local residents don't get you, then you can be sure that the cannibals, the mutants, the diseases, starvation or the roving road gangs will! You should expect a number of false starts before you learn enough to survive.

Next item on the agenda is to get control of a few towns yourself, since until you do so the powers that be won't give you your mission. Once you find out where the GUB (Government Underground Biolab) is situated you should get there as soon as possible since only then can you start on your real mission – to find eight missing scientists/agents and bring them safely to the GUB so that they can save the world. Some you will find easily, some you will get clues about and have to search for long and hard. For the last one or two you will be given a Radio Direction Finder which makes life ever so much easier!

The list of commands available includes F(ix Tires), H(eal sick with antitoxin), T(ransfer supplies to or from a cache), and E(mpire Status) which tells you which cities you control and how much progress you have made in your quest. Travel between the cities is done one square at a time across terrain such as roads, farmland, deserts, plains, forests, etc. All activities, including travel (which is affected by terrain) take time. In bad weather they take even longer. As you make each move the time and date are updated. Each night your men eat up food, each square you move (approximately 75 miles) your vehicles eat up gas. Keeping up your supplies can be a full time job in itself!

There are numerous locations where special things happen – you may find towns where they are handy with cars and improve your vehicles characteristics – make note of these, or where you find useful companions. You will need a doctor to reduce your casualties, a politician to help you in your recruitment, and a drill sergeant to improve the quality of your men – after each encounter a certain percentage of your surviving men will be promoted up through the ranks from Escort to Dragoon to Commando to Bodyguard and finally to Armsmaster. You will also have to make decisions. Will you let your men visit Disneyland or Fort Knox? Will you let them gamble in Las Vegas? When you reach wine country how much wine will you distribute? The right decisions will improve morale, the wrong ones will lose you men. You will also learn which places are dangerous, either because of the residents or, for example in certain parts of Mexico, because of the food!

NOW IT'S GETTING GOOD

Given all the foregoing, you already have a perfectly adequate game, but I haven't got to the good bit yet! The other major element of the game is the fights with the road gangs. You have three options for playing these. Your first choice is whether or not you want a detailed, tactical fight. If you decide against this the computer will very quickly play the fight out for you and tell you the results. Although this is easy and quick it has a number of drawbacks. First, you can't apply any of your skill to improving your chances so the outcome could usually be better, second you don't have the opportunity to capture enemy vehicles and third it doesn't change your limit of six vehicles.

I found the limit of six vehicles very restrictive and the only way to raise it is by playing out and surviving a detailed, tactical road combat – each win raises it by one up to a ceiling of 15.

If you have glanced at the rules and don't yet feel ready for

the full combat, there is a middle route. Say Yes to detailed, tactical combat, say Yes to auto-deploying (individually placing each of 200 men into the top or interior of each vehicle can be very tedious if you don't!), and also say Yes to Quick Combat. This overcomes the first drawback as you can now enter parameters to control how often you ram and which parts of the enemy cars you wish to aim at. A little thought here should improve your gang's chances. The computer will then play the fight out quickly for you.

Before declining the Quick Combat option and playing the full detailed combat you should carefully read the manual at least twice and study the Vehicle Table. You should also not expect to win your first few fights – make sure you save beforehand (the whole game is so deadly that you should save frequently anyway!). The instruction booklet is generally extremely good, and you should read all the notes from former gangleaders carefully since they contain many clues (there is also a good clue to a useful location on the back page!). However, in the explanation of moving and boarding especially I feel it could have been a lot better. There is a lot of detail left out, and no examples. You will need to experiment a lot to fully understand all the movement, firing and boarding rules.

The abbreviations shown on the screen are SP for speed, AC for acceleration, M for manoeuvrability, B for braking. You will need to watch these carefully and understand their interrelation in order to master movement – the faster you are going the more moves you get during each movement phase, but the less likely you are to be able to turn. You are highly likely to lose cars during your first few fights by crashing them into obstacles such as wrecks or buildings! If you can't tell which way something is facing check the screen for its FC or Facing – this number correlates with the compass points on the map and tells you which way you are going. Also the use of N(ext car) and Q(uit) in transfer operations is neither documented nor clear – use Q rather than N if you want all the options.

GET READY FOR THE FIGHT

So, once you have placed your men in their vehicles and armed them (firearms and crossbows only in this game I'm afraid) you get the chance to deploy your vehicles around the board. You will now have a bird's eye view of a small part of a large scrollable map. The terrain will depend on where you were when you were attacked, it could be a city maze of buildings and roads, farmland littered with trees and fences, an oilfield complete with derricks, rocks and mud, a road littered with wrecks, or one of many other terrains, each with their own tactical problems. At this point the only thing you know about the enemy's position is that they are somewhere off the screen to the right, so your main concern is placing your vehicles in such a way that they can avoid both each other and the immediate obstacles once the fight starts.

The rest of the battle consists of movement phases (including ramming), firing phases – each vehicle can fire two volleys so it is important to swing them round so that at least two of the sides of each vehicle have a view of the enemy, transfer phases, which allow you to move men up and down within a vehicle, or even between two vehicles if they are adjacent (this can of course be deadly!) and a boarding and melee phase – you control the boarding. If you have vehicles adjacent to enemy vehicles you can try sending men across to capture the enemy vehicle – if they get across then the computer resolves the melee and lets you know who's won.

There are 20 different vehicle types from motorcycles, through sports cars and limousines, right up to buses, tractors and trailer trucks. Each one has 21 different attributes, some of which, such as protection factors and manoeuvrability, can be improved if you find and/or loot the right cities. These factors affect not only the movement of the vehicles but also details such as how many men can fire out of one facing – from 2 on a motorcycle up to 26 on a bus (which can be quite devastating at close range!), how many can board from each facing or from the top, how many men and supplies can be carried, how many tyres they need and so on. The detail is superb and makes the detailed road combat into a complete sub-game in its own right – especially when you have a dozen vehicles, carrying hundreds of men, on each side.

A LITTLE TRIVIAL?

The only slight criticism of Roadwar 2000 is that the quest is a little trivial compared to the scope of the game. Trying to find the fifth and sixth scientists across over 120 cities once you have mastered the mechanics of the game and built a super-gang can go on a bit but even though I have finished it I keep going back to have more detailed road fights! One detail I might warn you about – each time you die and restart (rather than recall a saved game) it re-initialises and moves the GUB!

I played Roadwar 2000 on an IBM PC, then checked out how it looked on an ST at my friendly neighbourhood Atari shop – Intoto. The user interfaces have been completely revamped for the ST. On the PC the battle results scroll up line by line, so if 200 die in a battle you get 200 lines scrolling up at 2 or 3 a second! I made some notes that what they should really do is simply display the total statistics at the end of each round and, lo and behold, on the ST all results are flashed up instantaneously in windows – magic! The only catch on the ST is that it goes TOO fast. Make sure you set the speed as slow as possible to start with or you'll never work out what's going on. I would rather they had included an option to allow you to control the passage of events with the space bar. The ST also tends to use the mouse to pull down windows and point at commands. I personally find that this technique is not efficient if you wish to issue lots of single key commands in quick succession, the keyboard is much better – that is what it is designed for after all! Unfortunately they have not implemented all the commands on the keyboard, for example you can press P to search for People but the submenu you are presented with will NOT allow keyboard input.

Roadwar 2000 is without doubt an excellent game of its type – it won't be everyone's cup of tea because of the level of detail and the fact that you need to study the rule book so thoroughly. But if you give it a chance I am sure you will get addicted.

An Atari 8-bit version is planned but has not yet been released. Watch out for it and watch out for Roadwar Europa – coming soon!

ROADWAR 2000
SSI (US GOLD)
Disk. Price £24.99 (ST)
Price and availability of XL/XE version not known at present.

UPDATE

XWORD (ISSUE 28): How about an update to an update? And an apology for a major boob? Last issue we gave you an update to Designer Labels only it had nothing to do with Designer Labels, it was all about XWORD! Whoops. To all those who are mightily confused, it was us not you!

MJDBASE (ISSUE 29): Many thanks to Andrew Strevens for the following suggestions for using MJDBASE with a 130XE. This allows MJDBASE to be used with a Ramdisk giving instant access to the two modules of the program. It makes use of the RAMDISK MOVER program from Issue 28.

Follow these steps (use a back-up!):

1. Rename MJDBASE2.MGR to MJDB2MGR.D8 and rename MJDBASE2.UTL to MJDB2UTL.D8.
2. In line 200 of INTRO change MJDBASE2.MGR to MJDB2MGR.D8
In line 18860 of MJDB2MGR.D8 change MJDBASE2.UTL to MJDB2UTL.D8
Delete line 18850 of MJDB2MGR.D8 and re-enter as
? CHR$(125)
In line 7310 of MJDB2UTL.D8 change MJDBASE2.MGR to MJDB2MGR.D8
Delete line 7300 of MJDB2UTL.D8 and re-enter as
? CHR$(125)
3. Load the Ramdisk Mover program (RAMOVE.COM) onto the same disk as the three database programs and make sure you have the full DOS 2.5 on the disk.
In line 3060 of RAMOVE.COM change MENU to INTRO
4. Use DOS 2.5's SETUP.COM to set up an AUTORUN.SYS to run RAMOVE.COM

On boot-up, the regular 1050 will take 61 seconds to set up the database programs in Ramdisk and to display the main menu. Transfer between the Manager and Utilities sections of MJDBASE is now instantaneous and all that is now required in the disk drive is your Data disk.

***** STOP PRESS *****

3-D ANIMATOR (ISSUE 30): We are still working on all the problems with this one! Here is the first fix. For the 800XL, change Listing 2 so that the PROTECT=1600 in line 60 reads PROTECT=1738. Apparently there is more free RAM in an 800XL than in a 130XE!

THE ULT



Our Flight Expert John Davison reckons he has flown just about every flight simulator going, so we got him on a real one on the Microprose stand at the PCW show! Not so easy, John!

At the PCW Show a few months ago there was an item on display guaranteed to make the flight simulation fan drool – the fabulous Microprose Gunship Attack Helicopter Simulator. If you haven't heard, Gunship is Microprose's finest flight simulation product to date. It's very similar in concept to Digital Integration's Tomahawk, being a combat simulator based on a Hughes AH-64 Apache helicopter. The Gunship software has recently been built into a 'real' flight trainer rig, a massive machine standing about 8 feet high and weighing nearly one and a half tons! It's no wonder the Microprose stand was so popular.

LINK FLIGHT TRAINER

The original hardware was built in the USA by the Link company sometime in the 1940's. Yes, it's one of the legendary Link Trainers used to teach instrument flying techniques to many thousands of pilots. You'd never guess its ancestry by its current appearance, though. At some stage it was converted into a helicopter trainer, a role it fulfilled until the early 1970's, when it was donated to a flying club in the USA. Its history from that point is unclear until about 5 years ago, when it was discovered mouldering in the unlikely surroundings of a scuba diving equipment shop! It was found by inventor and computer enthusiast Marty Peck, who persuaded the shop to let him take

TIMATE SIMULATOR

it off their hands. Marty then reconditioned and rebuilt it in his garage as a hobby project, taking 18 months just to get the trainer's instruments and basic movements working again.

He then decided to bring it completely up to date by incorporating modern computer technology, custom designing and building special electronics to interface the trainer's flight controls to the onboard computers. A customised IBM PC-AT clone does most of the work, running the Gunship software and driving a specially designed soundboard. There's also a Commodore 128 involved somewhere in the works. (Wot, no Ataris?)

Unlike the original Link Trainer, Marty's machine provides the pilot with sight and sounds of his surroundings – by courtesy of the Gunship program, of course. Graphics are displayed on a Sony 19 inch colour monitor in front of the pilot, while the sounds of engines, rotor, and weapons receive full stereo reproduction through the integrated 20 watts per channel sound system.

The entire cockpit control panel has been redesigned to interface with the Gunship software, so the pilot can use real panel switches instead of a computer keyboard to operate the program. Although the monitor displays the Apache's essential instruments, the panel also carries a number of 'real' instruments such as altimeter, airspeed indicator, etc. And to start the engines there's a proper ignition key!

The pilot controls the Apache using authentic rudder pedals and collective and cyclic pitch control sticks. These affect the program just as a computer joystick would and cause the display on the monitor to react accordingly. The horizon rises, falls, and tilts convincingly, and the scenery pans across the screen if you turn, with ground details sliding under you realistically as you fly over them.

But now for the clever bit – the controls are also linked to the trainer's motion system. The cockpit is able to *physically* pitch or roll up to 30 degrees up/down or left/right and to horizontally rotate through 360 degrees, so the pilot gets a physical sensation of movement as well as seeing it on the screen. It's a flight simulator fan's dream machine.

BY INVITATION ONLY

Thanks to the efforts of the Editor I was lucky enough to get an invitation to fly the machine. (I always knew Editors had a use!) Marty Peck himself was there acting as instructor, and he carefully explained all the controls to me before closing the door and sliding the hood shut over my head. This provided complete isolation from the crowds outside – I really was in a simulated world of my own! Marty directed me from outside and we both wore headsets so we could communicate during the flight. Marty's microphone was also linked to the public address system on the stand, so everything he said could be heard by the watching crowds. The stand also had monitors slaved to the simulator's monitor, giving everyone a pilot's eye view of the flight. It also meant that any prangery by me would be VERY public!

Marty talked me through the startup sequence, and with the rotor spinning a gentle pull on the collective pitch lever caused the ground to smoothly drop away and we were airborne. Then, a forward movement of the cyclic pitch control caused the whole cockpit to tilt forward and the horizon to rise on the monitor, and the Apache began to accelerate rapidly forwards. Following Marty's instructions I flew a series of manoeuvres designed to locate an enemy ground target. At one stage I was skimming along very close to a mountain and had to take rapid action to avoid hitting it, causing the simulator to pitch, roll and rotate in an alarming manner. It feels much worse on the inside than it appears from the outside, I assure you!

Suddenly, we found an enemy tank. I selected a Hellfire missile with the appropriate panel switch and locked the aiming system onto the target. A squeeze on the firing trigger caused the missile to streak away, and after what seemed an eternity it blew the enemy to smithereens.



ENGINE FAILURE

Then Marty told me I was about to have an engine failure, and would have to perform an emergency landing. Under his guidance I uncoupled the rotor from the engines and got the Apache to autorotate, the helicopter equivalent of a glide. This resulted in a rapid descent, cushioned at the last moment by a judicious tweak of the controls. Emergency landing? Semi-controlled prang, more like!

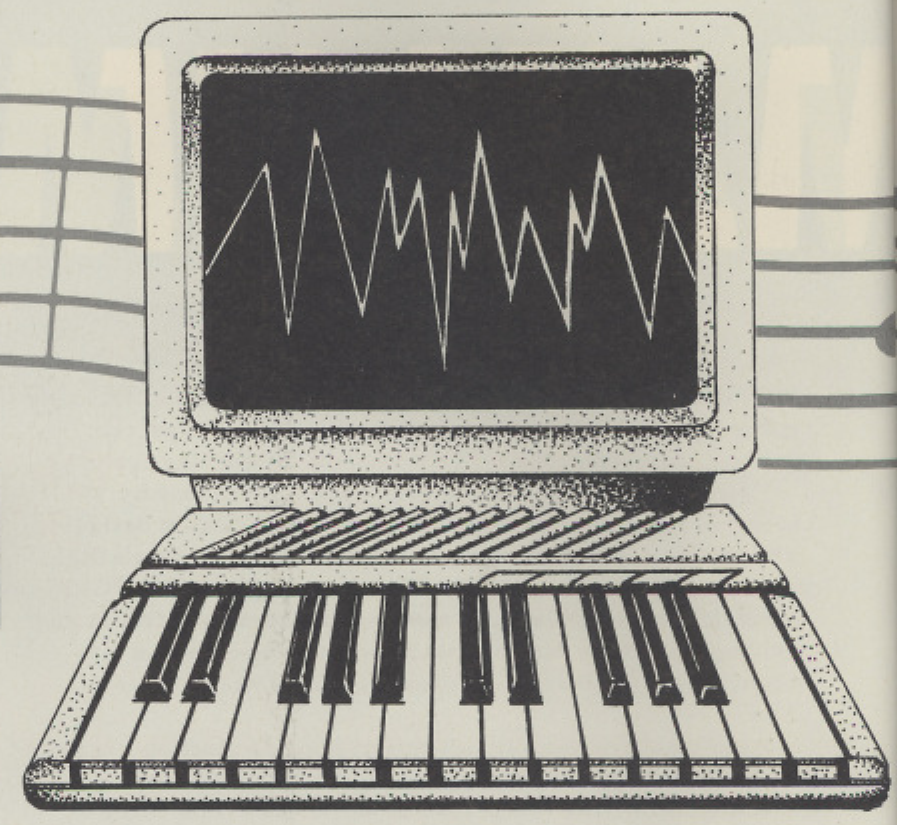
When Marty opened the door I staggered out with knees trembling and hands shaking. To prove I'd survived the ordeal I was presented with my 'Gunship Test Pilot' wings.

The Gunship software isn't out in Atari format yet, but has received rave reviews on other machines. From this short experience I can see why – it's got all the hallmarks of a classic simulator. An ST version should be in the shops by the time you read this, but don't hold your breath waiting for an 8-bit version. Microprose say there won't be one (shame on you, Microprose). If the ST version's anything like the one I flew here it should be a real treat. I hope to give it a detailed review as soon as I can lay my hands on a copy.

Finally, I'd like to thank everyone on the Microprose stand for making my visit such a memorable one, with special thanks to Marty Peck and Fred Schmidt for providing the material for this article. And thanks, Les, for making it all happen.

Bryan Kennerley will turn your keyboard into a unique sound synthesiser complete with light show!

ORIGINAL SYNTH



The sound capabilities of the Atari 8-bits are seldom held in high repute by any but the most avid Atari freaks, but surely the fact that a version of the POKEY chip (which is the heart of Atari sound generation) is responsible for the music on some top coin-op games, including Gauntlet, means there is a great deal of potential hidden away somewhere. Hopefully, this program will help realise some of that potential.

ORIGINAL SYNTH utilises the Atari's 'volume only' method of sound production. A full explanation of this is given in the book De Re Atari but here is a brief explanation to help you understand how the program works. You should be familiar with the BASIC SOUND command, if not you can look it up in many reference books or the BASIC manual. One of the parameters that may be set is 'distortion'.

If an odd distortion number is used with zero pitch and positive volume, a 'click' will be heard. The volume of the click will be equal to the difference between the previous and the new volume. For example, if you specify volume 0 and then volume 15, the resultant volume will be 15. If you then specify 15 again, the resulting volume be 0 (15 – 15). If a great many of these clicks are produced in succession, a musical tone can be produced. From BASIC only a low buzz can be produced but when using machine code, the loop must be slowed down since at full speed only dogs would be able to hear it! Original Synth makes use of this feature to produce some very interesting sounds,

THE DISPLAY

When the program is RUN, you are shown a graphical view of the ADSR. This is how the volume of the note changes as the note is played. Unless you have changed anything, the volume will start off at full, decay to half volume, stay at half for a while and then fade away to silence. This can be altered to produce special effects but more about that later. Every calibration on the ADSR display is equal to one second of real time.

If you press 'V', the display will change to show the current waveform. The waveform controls how the note actually sounds. For example, brass instruments typically produce a triangular waveform. This program cannot synthesize an instrument exactly, however, since the waveform of an instrument varies as the note is played but it can give an approximation of different types of instrument.

THE MENU

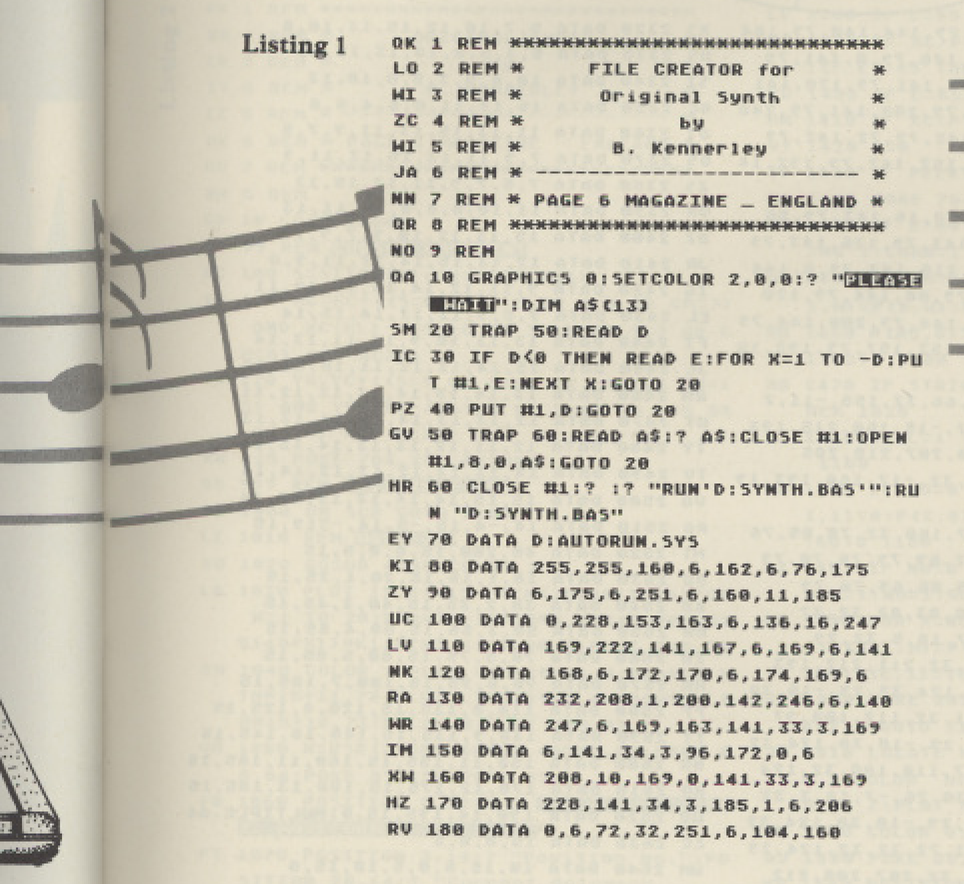
The lower half of the screen shows a menu of options. I will explain each option in order:

Sound Type – When this is set to FULL the ADSR is enabled. When set to PURE the volume remains constant and the note is purer.
Distortion – When enabled the screen is still displayed as the notes are played, resulting in a more fragmented, less musical, tone.
Light Show – When enabled, each note is accompanied by coloured lines moving up or down the screen.
Configure – If you find that you are using a certain combination of waveform and ADSR frequently, choose this option to save the combination to disk. When you next run the program, that combination will automatically load.
View xxxx – Scrolls between the ADSR and waveform display.
Edit – Edits either the waveform or ADSR, depending on which is currently displayed. Note that in editing mode the cursor is only one Graphics 8 pixel and may be difficult to locate.

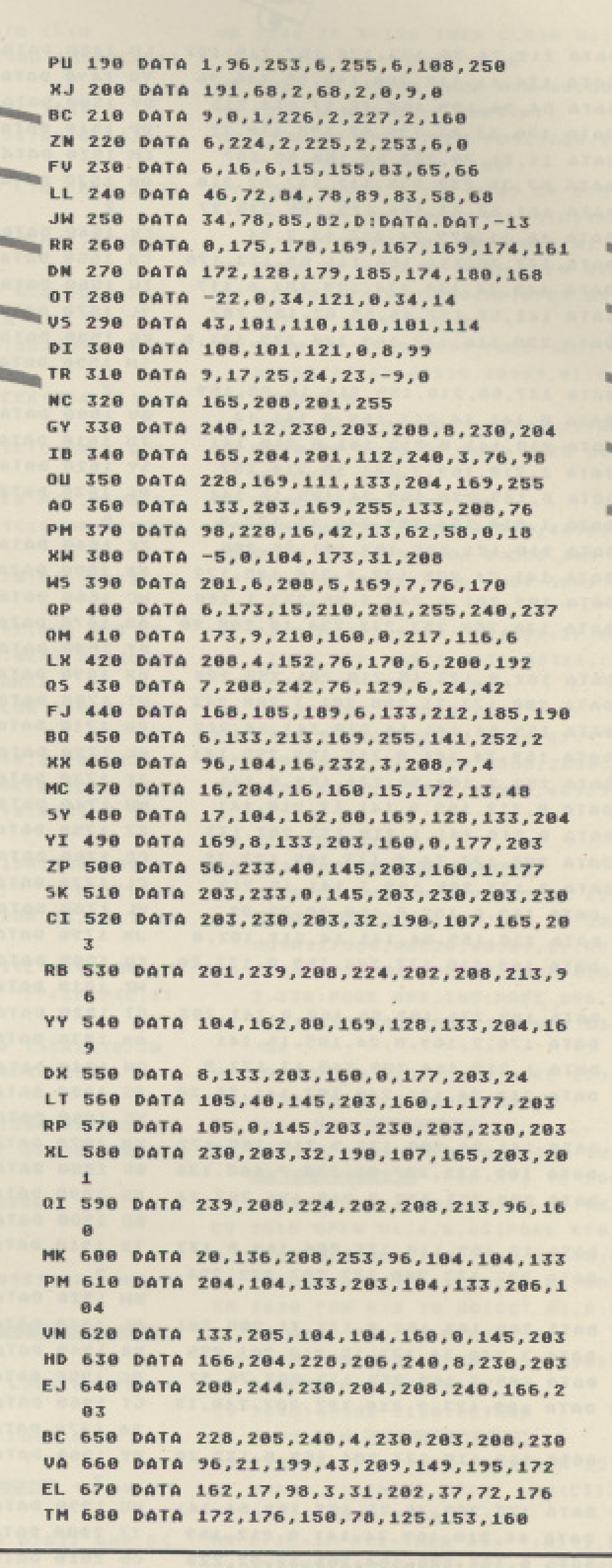
For **Waveform Editing**, move the flashing cursor around the screen with joystick 1 or the cursor keys and alter a point with the fire button or by holding the Return key. To alter the length of the waveform, position the cursor and hold the space bar. Shortening the waveform generally makes all notes higher and lengthening it lowers all notes. This is not always the case though, since altering the number of peaks present may counteract this effect.

ADSR Editing takes a different form to the waveform because there are 512 possible points for the cursor. The joystick and cursor keys move the cursor 1 point at a time while TAB and SHIFT + TAB move the cursor 20 points right or left respectively. Holding the fire button or Return key plots a point after which the computer joins the points with a line. Up to 64 points can be plotted at any one time. Holding space will delete a point providing the cursor is on a point previously set. This can be determined by the Point Set message on screen which will show whether the point at which the cursor is residing has been set.

Listing 1



```
QK 1 REM *****************************
LO 2 REM *     FILE CREATOR for      *
WI 3 REM *      Original Synth       *
ZC 4 REM *            by             *
WI 5 REM *       B. Kennerley        *
JA 6 REM * ------------------------- *
NN 7 REM * PAGE 6 MAGAZINE _ ENGLAND *
QR 8 REM *****************************
NO 9 REM
QA 10 GRAPHICS 0:SETCOLOR 2,0,0:? "PLEASE
   WAIT":DIM A$(13)
SM 20 TRAP 50:READ D
IC 30 IF D<0 THEN READ E:FOR X=1 TO -D:PU
   T #1,E:NEXT X:GOTO 20
PZ 40 PUT #1,D:GOTO 20
GV 50 TRAP 60:READ A$:? A$:CLOSE #1:OPEN
   #1,8,0,A$:GOTO 20
HR 60 CLOSE #1:? :? "RUN'D:SYNTH.BAS'":RU
   N "D:SYNTH.BAS"
EY 70 DATA D:AUTORUN.SYS
KI 80 DATA 255,255,160,6,162,6,76,175
ZY 90 DATA 6,175,6,251,6,160,11,185
UC 100 DATA 0,228,153,163,6,136,16,247
LV 110 DATA 169,222,141,167,6,169,6,141
NK 120 DATA 168,6,172,170,6,174,169,6
RA 130 DATA 232,208,1,200,142,246,6,140
WR 140 DATA 247,6,169,163,141,33,3,169
IM 150 DATA 6,141,34,3,96,172,0,6
XW 160 DATA 208,10,169,0,141,33,3,169
HZ 170 DATA 228,141,34,3,185,1,6,206
RV 180 DATA 0,6,72,32,251,6,104,160
```



```
PU 190 DATA 1,96,253,6,255,6,108,250
XJ 200 DATA 191,68,2,68,2,0,9,0
BC 210 DATA 9,0,1,226,2,227,2,160
ZN 220 DATA 6,224,2,225,2,253,6,0
FV 230 DATA 6,16,6,15,155,83,65,66
LL 240 DATA 46,72,84,78,89,83,58,68
JW 250 DATA 34,78,85,82,D:DATA.DAT,-13
RR 260 DATA 0,175,178,169,167,169,174,161
DN 270 DATA 172,128,179,185,174,180,168
OT 280 DATA -22,0,34,121,0,34,14
VS 290 DATA 43,101,110,110,101,114
DI 300 DATA 108,101,121,0,8,99
TR 310 DATA 9,17,25,24,23,-9,0
NC 320 DATA 165,208,201,255
GY 330 DATA 240,12,230,203,208,8,230,204
IB 340 DATA 165,204,201,112,240,3,76,98
OU 350 DATA 228,169,111,133,204,169,255
AO 360 DATA 133,203,169,255,133,208,76
PM 370 DATA 98,228,16,42,13,62,58,0,18
XW 380 DATA -5,0,104,173,31,208
WS 390 DATA 201,6,208,5,169,7,76,170
QP 400 DATA 6,173,15,210,201,255,240,237
OM 410 DATA 173,9,210,160,0,217,116,6
LX 420 DATA 208,4,152,76,170,6,200,192
QS 430 DATA 7,208,242,76,129,6,24,42
FJ 440 DATA 168,185,189,6,133,212,185,190
BQ 450 DATA 6,133,213,169,255,141,252,2
XX 460 DATA 96,104,16,232,3,208,7,4
MC 470 DATA 16,204,16,160,15,172,13,48
SY 480 DATA 17,104,162,80,169,128,133,204
YI 490 DATA 169,8,133,203,160,0,177,203
ZP 500 DATA 56,233,40,145,203,160,1,177
SK 510 DATA 203,233,0,145,203,230,203,230
CI 520 DATA 203,230,203,32,190,107,165,20
   3
RB 530 DATA 201,239,208,224,202,208,213,9
   6
YY 540 DATA 104,162,80,169,128,133,204,16
   9
DX 550 DATA 8,133,203,160,0,177,203,24
LT 560 DATA 105,40,145,203,160,1,177,203
RP 570 DATA 105,0,145,203,230,203,230,203
XL 580 DATA 230,203,32,190,107,165,203,20
   1
QI 590 DATA 239,208,224,202,208,213,96,16
   0
MK 600 DATA 20,136,208,253,96,104,104,133
PM 610 DATA 204,104,133,203,104,133,206,1
   04
VN 620 DATA 133,205,104,104,160,0,145,203
HD 630 DATA 166,204,228,206,240,8,230,203
EJ 640 DATA 208,244,230,204,208,240,166,2
   03
BC 650 DATA 228,205,240,4,230,203,208,230
VA 660 DATA 96,21,199,43,209,149,195,172
EL 670 DATA 162,17,98,3,31,202,37,72,176
TM 680 DATA 172,176,150,78,125,153,160
```

I/O – After choosing which type of I/O you require, you will be presented with a directory of waveforms or ADSRs as appropriate. Choose which file you want by typing its number. If you are saving a new file you will be prompted for a filename. Just type the name and NOT the "D:" or extender. Pressing the Escape key will abort the operation at any time before the file number is chosen. Be careful! The program is only protected against the 'FILE NOT PRESENT' error and no other disk error is accommodated such as 'DISK FULL'.

PLAYING MUSIC

This what all that editing is for! Press START to enter music mode and the computer becomes a 3½ octave piano keyboard as shown in Figure 1. SPACE is the lowest note and RETURN is the highest. Z-INV and Q-RET are the 'white' notes while S-; and 1-DEL are the 'black' notes. Pressing OPTION at any time will return to the main menu. The notes played by this keyboard will sound according to how you have set the waveform and ADSR. I have provided several examples which you can load in from your disk, but you are free to design as many as you wish!

I have found that playing music with this program has helped me understand the layout of the piano keyboard and the intricacies of sound shaping. As an added bonus it has improved my finger/keyboard coordination and so increased my typing speed and accuracy considerably. I hope it will bring you enjoyment and benefit in a similar way.

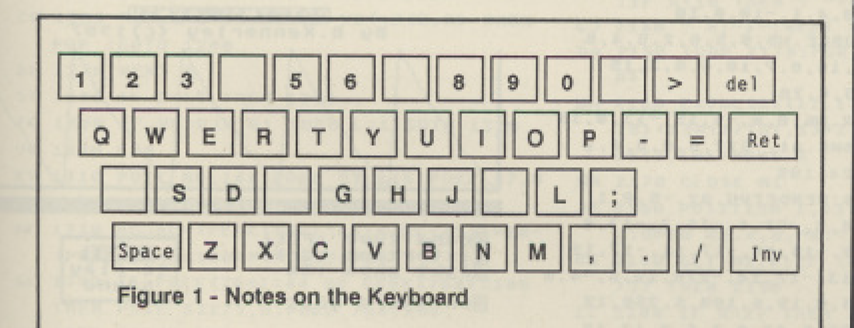


Figure 1 - Notes on the Keyboard

TYPING IT IN

You will need a disk with at least 250 free sectors and it is recommended that you start with a freshly formatted disk as this can be used to autoboot Original Synth.

1. Type in listing 1, checking it with TYPO 3, and save it with the filename D:CREATOR.BAS

2. Type in listing 2, again checking it with TYPO 3, and save it with the filename D:SYNTH.BAS.

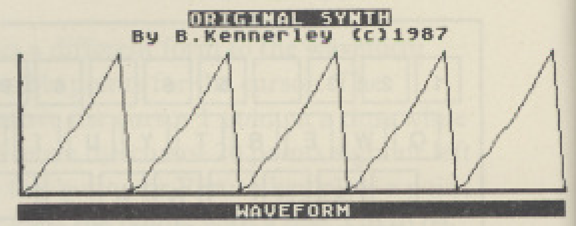
3. Ensure that your disk remains in drive 1 and is not write protected and then load and RUN D:CREATOR.BAS. This will create an AUTORUN.SYS and several other DATA and support files (13 in all) and then will the run SYNTH.BAS

4. CREATOR.BAS need only be RUN once, after which you may either auto-boot the disk or type RUN "D:SYNTH.BAS" whenever you wish to use the program.

ORIGINAL SYNTH

Listing 2

```
XM 690 DATA 212,74,26,133,178,167,210,127
GE 700 DATA 134,11,112,200,165,85,146,96
TF 710 DATA 54,94,199,168,37,17,214,215
LT 720 DATA 170,33,83,195,62,193,118,22
LO 730 DATA 11,21,79,229,62,158,65,187
NX 740 DATA 57,36,232,235,112,137,52,210
NI 750 DATA 161,68,33,164,125,185,238,27
LY 760 DATA 16,11,229,74,223,13,3,84
YF 770 DATA 173,35,111,166,111,69,123,176
NS 780 DATA 149,34,138,234,179,183,6,117
TU 790 DATA 142,62,127,46,65,62,187,207
OS 800 DATA 220,116,137,169,126,229,121,6
   0
IT 810 DATA 137,60,210,155,214,16,85,169
KV 820 DATA 0,141,14,212,169,0,141,14
YB 830 DATA 210,141,0,212,141,0,210,141
AT 840 DATA 1,210,169,3,141,15,210,162
AU 850 DATA 0,189,236,109,24,105,16,141
JV 860 DATA 1,210,164,209,240,12,172,9
FR 870 DATA 210,121,240,107,141,26,208
BB 880 DATA 141,24,208,172,9,210,185,172
OT 890 DATA 109,201,0,240,3,56,233,1,168
JP 900 DATA 136,208,253,232,224,10,208,20
   9
NH 910 DATA 162,0,173,15,210,201,255,208
KD 920 DATA 208,173,31,208,201,3,208,242
FP 930 DATA 169,64,141,14,210,141,14,212
WY 940 DATA 169,34,141,0,212,169,255,141
LG 950 DATA 252,2,104,96,224,169,0,141
SG 960 DATA 0,212,169,0,141,12,210,141
KB 970 DATA 0,210,141,1,210,133,207,133
CO 980 DATA 208,173,34,2,133,205,173,35
CB 990 DATA 2,133,206,169,3,141,15,210
DW 1000 DATA 169,6,162,6,160,80,32,92
NP 1010 DATA 228,169,64,141,14,212,162,0
BX 1020 DATA 169,110,133,204,169,0,133,20
   3
LH 1030 DATA 189,236,109,56,160,0,241,203
HK 1040 DATA 176,2,169,0,24,105,16,141
CN 1050 DATA 1,210,164,209,240,13,172,9
DB 1060 DATA 210,24,121,240,107,141,26,20
   8
WX 1070 DATA 141,24,208,172,9,210,185,172
FA 1080 DATA 109,132,207,56,233,7,168,136
SF 1090 DATA 208,253,172,9,210,196,207,24
   0
IT 1100 DATA 12,169,110,133,204,169,0,133
UK 1110 DATA 203,133,208,132,207,232,224,
   10
GE 1120 DATA 208,182,162,0,173,31,208,201
MA 1130 DATA 3,240,34,173,15,210,201,255
YS 1140 DATA 208,7,169,255,133,207,76,97
RH 1150 DATA 109,173,9,210,197,207,240,15
   2
CL 1160 DATA 169,110,133,204,169,0,133,20
   3
DQ 1170 DATA 133,208,76,23,109,169,64,141
UT 1180 DATA 14,210,169,34,141,0,212,169
GQ 1190 DATA 6,166,206,164,205,32,92,228
TK 1200 DATA 169,64,141,14,212,169,255,14
   1
UC 1210 DATA 252,2,104,96,169,105
QK 1220 DATA 127,93,-5,0,26,0,22,36
PQ 1230 DATA 14,31,20,17,173,0,184
UG 1240 DATA 0,0,153,208,234,0,0,59
VA 1250 DATA 41,0,48,67,76,112,246,99
PT 1260 DATA 135,0,119,87,82,51,0,55
QL 1270 DATA 38,0,44,63,72,28,0,24
ZX 1280 DATA 0,15,33,0,19,0,144,195
PV 1290 DATA 0,0,164,221,112,112,112,66
GR 1300 DATA 0,6,2,79,16,133,79,56
ZJ 1310 DATA 133,79,96,133,79,136,133,79
FF 1320 DATA 176,133,79,216,133,79,0,134
QB 1330 DATA 79,40,134,79,80,134,79,120
GZ 1340 DATA 134,79,160,134,79,200,134,79
OX 1350 DATA 240,134,79,24,135,79,64,135
TK 1360 DATA 79,104,135,79,144,135,79,184
JD 1370 DATA 135,79,224,135,79,8,136,79
DZ 1380 DATA 48,136,79,88,136,79,128,136
EH 1390 DATA 79,168,136,79,208,136,79,248
JX 1400 DATA 136,79,32,137,79,72,137,79
NA 1410 DATA 112,137,79,152,137,79,192,13
   7
KJ 1420 DATA 79,232,137,79,16,138,79,56
ND 1430 DATA 138,79,96,138,79,136,138,79
VH 1440 DATA 176,138,79,216,138,79,0,139
ZP 1450 DATA 79,40,139,79,80,139,79,120
VD 1460 DATA 139,79,160,139,79,200,139,79
IO 1470 DATA 240,139,79,24,140,79,64,140
LU 1480 DATA 79,104,140,79,144,140,79,184
YO 1490 DATA 140,79,224,140,79,8,141,79
OY 1500 DATA 48,141,79,88,141,79,128,141
VP 1510 DATA 79,168,141,79,208,141,79,248
ZM 1520 DATA 141,79,32,142,79,72,142,79
AH 1530 DATA 112,142,79,152,142,79,192,14
   2
CX 1540 DATA 79,232,142,79,16,143,79,56
CO 1550 DATA 143,79,96,143,79,136,143,79
IW 1560 DATA 176,143,79,216,143,79,0,144
SL 1570 DATA 79,40,144,79,80,144,79,120
KG 1580 DATA 144,79,160,144,79,200,144,79
SM 1590 DATA 240,144,79,152,157,79,192,15
   7
AV 1600 DATA 79,232,157,66,32,158,-11,2
TU 1610 DATA 65,0,128,32,-15,160,215,193
SY 1620 DATA 214,197,198,207,210,205
RG 1630 DATA -15,160,32,32,-17,160,193,19
   6
ZE 1640 DATA 211,210,-17,160,32,70,85,76
NK 1650 DATA 76,80,85,82,69,79,70,70,79
WC 1660 DATA 78,32,87,65,86,69,70,79
AQ 1670 DATA 82,77,65,68,83,82,32,32
BT 1680 DATA 32,32,17,-7,18,5,32,29
BX 1690 DATA -10,30,124,32,211,212,193
WT 1700 DATA 210,212,32,124,32,29,-10,30
OR 1710 DATA 124,116,111,32,112,108,97
AK 1720 DATA 121,124,32,29,-10,30,124,32
IF 1730 DATA 115,111,117,110,100,32,124
MU 1740 DATA 32,29,-10,30,26,-7,18,3,32
EZ 1750 DATA 17,-8,18,5,29,-10,30,124,32
CC 1760 DATA 32,80,85,83,72,32,32,124,29
CL 1770 DATA -10,30,124,32,207,208,212
VL 1780 DATA 201,207,206,32,124,29,-10,30
JX 1790 DATA 124,70,79,82,32,77,69,78,85
TU 1800 DATA 124,29,-10,30,26,-8,18
WZ 1810 DATA 3,17,-11,18,5,29,-13,30
GT 1820 DATA 124,80,82,69,83,83,32
AA 1830 DATA 211,208,193,195,197,124,29
ON 1840 DATA -13,30,124,32,84,79
EI 1850 DATA 32,32,65,76,84,69,82,32
XC 1860 DATA 124,29,-13,30,124
KH 1870 DATA 32,32,76,69,78,71,84,72
BD 1880 DATA 32,32,32,124,29,-13,30,26
GG 1890 DATA -11,18,3,17,-11,18,5,29
BO 1900 DATA -13,30,124,80,82,69,83,83
IQ 1910 DATA 32,211,208,193,195,197,124,2
   9
BW 1920 DATA -13,30,124,32,84
OL 1930 DATA 79,32,32,69,82,65,83,69
XA 1940 DATA 32,124,29,-13,30
RG 1950 DATA 124,32,32,32,80,79,73,78
GT 1960 DATA 84,32,32,32,124,29
SA 1970 DATA -13,30,26,-11,18,3
NY 1980 DATA 89,69,83,78,79,32,204,207,19
   3
HU 1990 DATA 196,160,211,193,214,197,160
IZ 2000 DATA 215,193,214,197,198,207,210
CD 2010 DATA 205,193,196,211,210,-5,32
FQ 2020 DATA D:BOOT.DAT,0,1,3,4,6,7,9
SR 2030 DATA 11,13,15,-15,0,1,2,3,4,5
NJ 2040 DATA -99,6,-16,7,-17,8,-17,9
RS 2050 DATA -16,10,-17,11,-17,12,-16,13
PQ 2060 DATA -17,14,-270,15,-4,0
NW 2070 DATA 2,0,4,0,10,6,100,6,250,15
DT 2080 DATA -116,0,6,10,0,0,1
UY 2090 DATA D:BLANK.W1,-20,0,10,1,0,1
WW 2100 DATA 56,233,1,7
RU 2110 DATA D:SAWTOOTH.W2,0,1,3,4,6,7,9
FE 2120 DATA 11,13,15,-10,0,10
PA 2130 DATA D:WEIRD.W3,0,2,0,5,0,8
EX 2140 DATA 0,11,0,15,-9,0,0,10
SZ 2150 DATA D:SINE.W4,0,1,4,10,14,15
AY 2160 DATA 14,10,4,1,-10,0,10
XN 2170 DATA D:DOUBLE.W5,0,5,6,2,5,4,8
ZI 2180 DATA 7,15,15,0,7,10,6,8,3,15
ST 2190 DATA 12,15,6,20
JY 2200 DATA D:BOX.W6,0,0,-5,15,-13,0,10
HA 2210 DATA D:BLANK.A1,-512,0,0,0,0,1
QQ 2220 DATA 0,0,24,105
HC 2230 DATA 2,3,D:RENDEZVU.A2,-5,0,1
IY 2240 DATA 2,3,4,5,-99,6,-16,7,-17,8
DX 2250 DATA -17,9,-16,10,-17,11,-17,12
LN 2260 DATA -16,13,-17,14,-270,15,6,-4,0
OA 2270 DATA 2,0,4,0,10,6,100,6,250,15
GG 2280 DATA D:WARBLE.A3,0,3,6,9,12,15
AW 2290 DATA 12,9,7,4,1,4,7,9,12
WJ 2300 DATA 15,12,9,7,4,1,4,7
SV 2310 DATA 9,12,15,12,10,7,5,2
XS 2320 DATA 5,7,10,12,15,13,10,8
US 2330 DATA 5,3,5,8,10,13,15,13
SI 2340 DATA 10,8,5,3,5,8,10,13
BC 2350 DATA 15,13,11,8,6,4,6,8
DT 2360 DATA 11,13,15,13,11,9,7,5
DS 2370 DATA 7,9,11,13,15,13,11,9
ZS 2380 DATA 7,5,7,9,11,13,15,13
VX 2390 DATA 11,10,8,6,8,10,11,13
BZ 2400 DATA 15,13,12,10,9,7,9,10
JR 2410 DATA 12,13,15,14,12,11,9,8
IG 2420 DATA 9,11,12,14,15,14,12,11
EL 2430 DATA 9,8,9,11,12,14,15,14
FI 2440 DATA 13,11,10,9,10,11,13,14
JL 2450 DATA 15,14,13,12,11,10,11,12
QM 2460 DATA 13,14,15,14,13,13,12,11
UT 2470 DATA 12,13,13,14,15,14,13,13
TY 2480 DATA 12,11,12,13,13,14,15,14
TV 2490 DATA 14,13,13,12,13,13,14,14
VQ 2500 DATA 15,15,14,14,13,13,13,14
RA 2510 DATA 14,-4,15,-5,14,-319,15
MT 2520 DATA 40,200,15,0,0,5,15
BQ 2530 DATA 10,1,15,15,20,1,25,15
KB 2540 DATA 30,2,35,15,40,3,45,15
RN 2550 DATA 50,3,55,15,60,4,65,15
ZN 2560 DATA 70,5,75,15,80,5,85,15
HN 2570 DATA 90,6,95,15,100,7,105,15
FF 2580 DATA 110,8,115,15,120,8,125,15
TT 2590 DATA 130,9,135,15,140,10,145,15
NR 2600 DATA 150,11,155,15,160,11,165,15
XQ 2610 DATA 170,12,175,15,180,13,185,15
UO 2620 DATA 190,14,195,15,D:MULTIPLE.A4
ZC 2630 DATA 15,8,0,5
WH 2640 DATA 10,15,8,0,5,10,15,8
MO 2650 DATA 0,5,10,15,8,0,5,10
RG 2660 DATA 15,8,0,5,10,15,8,0
SN 2670 DATA 5,10,15,8,0,5,10,15
RU 2680 DATA 8,0,5,10,15,8,0,5
WW 2690 DATA 10,15,8,0,5,10,15,8
MB 2700 DATA 0,5,10,15,8,0,5,10
QT 2710 DATA 15,8,0,5,10,15,8,0
SA 2720 DATA 5,10,15,8,0,5,10,15
RH 2730 DATA 8,0,5,10,15,8,0,5
WJ 2740 DATA 10,15,8,0,5,10,15,8
MQ 2750 DATA 0,5,10,15,8,0,5,10
RI 2760 DATA 15,8,0,5,10,15,8,0
SP 2770 DATA 5,10,15,8,0,5,10,15
RW 2780 DATA 8,0,5,10,15,8,0,5
WY 2790 DATA 10,15,8,0,5,10,15,8
MD 2800 DATA 0,5,10,15,8,0,5,10
QV 2810 DATA 15,8,0,5,10,15,8,0
SC 2820 DATA 5,10,15,8,0,5,10,15
QS 2830 DATA -356,15,63,0,0,0
MA 2840 DATA 15,2,0,5,15,7,0,10
ZR 2850 DATA 15,12,0,15,15,17,0,20
DE 2860 DATA 15,22,0,25,15,27,0,30
GR 2870 DATA 15,32,0,35,15,37,0,40
KE 2880 DATA 15,42,0,45,15,47,0,50
NR 2890 DATA 15,52,0,55,15,57,0,60
QC 2900 DATA 15,62,0,65,15,67,0,70
TP 2910 DATA 15,72,0,75,15,77,0,80
XC 2920 DATA 15,82,0,85,15,87,0,90
XH 2930 DATA 15,92,0,95,15,97,0,100
NH 2940 DATA 15,102,0,105,15,107,0,110
RE 2950 DATA 15,112,0,115,15,117,0,120
VB 2960 DATA 15,122,0,125,15,127,0,130
YY 2970 DATA 15,132,0,135,15,137,0,140
CV 2980 DATA 15,142,0,145,15,147,0,150
FV 2990 DATA 15,152,0,155,15
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Listing 2

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OK 1 REM ****************************
BR 2 REM *       ORIGINAL SYNTH      *
ZB 3 REM *             by            *
IT 4 REM *       B. KENNERLEY        *
IZ 5 REM * ------------------------- *
RK 6 REM * PAGE 6 MAGAZINE - ENGLAND *
OO 7 REM ****************************
NN 8 REM
GD 10 GOTO 20000
CC 99 REM CURSOR MOVEMENT
KZ 100 S=STICK(0):CH=PEEK(764)
PK 110 XC=XC+((S=6 OR S=7 OR S=5 OR CH=7)
    AND XC<XL)-((S=10 OR S=11 OR S=9 OR C
   H=6) AND XC>0)
SI 120 YC=YC+((S=9 OR S=13 OR S=5 OR CH=1
   5) AND YC<15)-((S=10 OR S=14 OR S=6 OR
    CH=14) AND YC>0)
XU 125 POKE 764,255:RETURN
OR 999 REM EDIT ROUTINES
FI 1000 ON SCR GOTO 1180
LZ 1010 REM WAVEFORM
XQ 1020 GOSUB 4500:COLOR 1
LB 1030 PLOT 11,4+(15-PEEK(28140))*K1:FOR
    X=1 TO 20:DRAWTO 11+15*X,4+(15-PEEK(2
   8140+X))*K1:NEXT X:COLOR 0:PLOT 319,79
EH 1040 COLOR 1:PLOT LTH*15+11,4:DRAWTO L
   TH*15+11,73:PLOT LTH*15+12,4:DRAWTO LT
   H*15+12,73:COLOR 0:PLOT 319,79
VB 1050 X=USR(27588,40520,40959,0):POKE 8
   8,64:POKE 89,156:POKE 87,0
PB 1060 POSITION 0,12:? "             EDI
   T  WAVEFORM              "
FT 1070 POSITION 3,14:? "Position No.":PO
   SITION 20,14:? "Current Volume="
KK 1080 POSITION 3,17:? G$(299,419):POSIT
   ION 23,17:? G$(205,298):POSITION 10,15
   :? "WAVEFORM LENGTH="
HE 1090 POKE 88,16:POKE 89,133:POKE 87,8:
   LOCATE 15*XC+11,YC*K1+4,Z
EG 1100 FOR X=0 TO 1:COLOR  NOT Z:PLOT 15
   *XC+11,YC*K1+4:COLOR Z:PLOT 15*XC+11,Y
   C*K1+4:NEXT X:COLOR 0:PLOT 319,79
DD 1110 GOSUB 100:IF PEEK(53279)=3 THEN 1
   160
LP 1120 POKE 88,64:POKE 89,156:POKE 87,0:
   POSITION 15,14:? XC;" ":POSITION 35,14
   :? 15-YC;" ":POSITION 26,15:? LTH;" "
NJ 1130 IF PEEK(764)=33 THEN LTH=XC:POKE
   764,255:POKE 27828,LTH:POKE 27998,LTH:
   GOTO 1020
BW 1140 IF STRIG(0)=1 AND PEEK(764)<>12 T
   HEN 1090
PG 1150 POKE 28140+XC,15-YC:GOTO 1020
DC 1160 X=USR(27588,34064,37263,0):GOSUB
   3000:X=USR(27588,40520,40959,0):POKE 8
   8,64:POKE 89,156:RETURN
PJ 1170 REM ADSR
SA 1180 GOSUB 3100:POKE 88,144:POKE 89,14
   5:POKE 87,8:COLOR 1
DN 1190 IF NO=0 THEN 1210
ES 1200 FOR X=1 TO NO:PLOT P(X,0)*K+6,2:N
   EXT X
OG 1210 COLOR 0:PLOT 319,79:POKE 88,64:PO
   KE 89,156:POKE 87,0
AK 1220 POSITION 0,12:? "              ED
   IT - ADSR                ":X=USR(27588,
   40520,40959,0)
BK 1230 POSITION 12,14:? "X=":POSITION 19
   ,14:? "VOLUME=":POSITION 6,15:? "Time
   After Start=":POSITION 12,16:? "Point
   Set?"
SA 1240 POSITION 3,18:? G$(420,540):POSIT
   ION 23,18:? G$(205,298)
TD 1250 IF NO=0 THEN L=0:GOTO 1310
CG 1260 FOR E=1 TO NO:IF XC<=P(E,0) THEN
   POP :GOTO 1280
DW 1270 NEXT E
ST 1280 IF E=65 THEN 1300
EQ 1290 IF XC=P(E,0) THEN L=1:GOTO 1310
VQ 1300 L=0
KY 1310 POKE 88,144:POKE 89,145:POKE 87,8
EC 1320 IF PEEK(53279)=3 THEN 1580
WF 1330 XC=XC+(PEEK(764)=44)*(XC<493)*20-
   (PEEK(764)=108)*(XC>19)*20
GL 1340 IF PEEK(764)=44 OR PEEK(764)=108
   THEN POKE 53279,0:POKE 764,255
VM 1350 GOSUB 100
BJ 1360 IF NO=0 THEN L=0:GOTO 1470
ZM 1370 IF E>1 AND XC<=P(E-1,0) THEN E=E-
   1:GOTO 1370
LC 1380 IF E=65 THEN L=0:GOTO 1510
PC 1390 IF XC>P(E,0) AND E<=NO THEN E=E+1
   :IF E<>65 THEN 1390
KG 1400 IF E=65 THEN L=0:GOTO 1510
HW 1410 IF XC=P(E,0) THEN L=1:GOTO 1430
VY 1420 L=0
IV 1430 IF PEEK(764)<>33 OR L=0 THEN 1470
HC 1435 POKE 764,255
HU 1440 IF E=NO THEN P(E,0)=0:P(E,1)=0:NO
   =NO-1:CHAN=1:GOTO 1180
HH 1450 FOR X=E+1 TO NO:FOR W=0 TO 1:P(X-
   1,W)=P(X,W):NEXT W:NEXT X
HB 1460 P(NO,0)=0:P(NO,1)=0:NO=NO-1:CHAN=
   1:GOTO 1180
XB 1470 IF STRIG(0)=1 AND PEEK(764)<>12 T
   HEN 1510
AI 1480 IF L=1 THEN P(E,1)=YC:CHAN=1:GOTO
    1180
MA 1485 IF NO=0 AND XC>0 THEN P(1,0)=0:P(
   1,1)=0:P(2,0)=XC:P(2,1)=YC:CHAN=1:NO=2
   :GOTO 1180
BZ 1487 IF NO=0 THEN P(1,0)=0:P(1,1)=YC:C
   HAN=1:NO=1:GOTO 1180
KI 1490 FOR X=NO TO E STEP -1:FOR W=0 TO
   1:P(X+1,W)=P(X,W):NEXT W:NEXT X:P(E,0)
   =XC:P(E,1)=YC:NO=NO+1:CHAN=1
QV 1500 POKE 28160+XC,YC:COLOR 1:PLOT XC*
   K+7,2:GOTO 1180
JC 1510 LOCATE XC*K+6,YC*K1+4,Z:FOR X=0 T
   O 1:COLOR  NOT Z:PLOT XC*K+6,YC*K1+4:C
   OLOR Z:PLOT XC*K+6,YC*K1+4:NEXT X
FC 1520 COLOR 0:PLOT 319,79
AJ 1530 POKE 88,64:POKE 89,156:POKE 87,0
XP 1540 POSITION 14,14:? XC;"  ":POSITION
    26,14:? 15-YC;" ":POSITION 23,15:? XC
   /50;" secs   "
YN 1550 POSITION 23,16:? G$((L=0)*3+541,(
   L=0)*3+543);:IF L THEN ? "-";15-P(E,1)
   ;" "
DO 1560 ? "    ":IF E=65 AND (STRIG(0)=0
   OR PEEK(764)=12) THEN ? CHR$(253)
SR 1570 GOTO 1280
ZZ 1580 X=USR(27588,37344,37384,0):X=USR(
   27588,40520,40959,0):POKE 88,64:POKE 8
   9,156:POKE 87,0
IN 1590 IF CHAN THEN GOSUB 3200
AL 1600 RETURN
IY 1999 REM I/O
QX 2000 X=USR(27588,40520,40959,0):POKE 7
   64,255:OPEN #1,4,0,"K:"
NC 2010 POSITION 0,12:? "              IN
   PUT/OUTPUT              "
CO 2020 POSITION 3,14:? "1) Load Waveform
     3) Save Waveform"
IH 2030 POSITION 3,15:? "2) Load ADSR
     4) Save ADSR"
AS 2040 POSITION 12,23:? "Escape to exit"
   ;
ZJ 2050 GET #1,D:IF (D<49 OR D>52) AND D<
   >27 THEN 2050
NC 2060 CLOSE #1
TS 2070 IF D=27 THEN 2410
FB 2080 X=USR(27588,40520,40959,0)
BI 2090 POSITION 4,23:? G$((D=51 OR D=52)
   *5+547,(D=51 OR D=52)*5+551);G$((D=50
   OR D=52)*8+557,(D=50 OR D=52)*8+564);
ZR 2100 POSITION 20,23:? "Escape to exit"
   ;
XQ 2110 IF D=49 OR D=51 THEN OPEN #1,6,0,
   "D:*.W??":GOTO 2130
WL 2120 OPEN #1,6,0,"D:*.A??"
SZ 2130 FOR X=1 TO 24:POSITION 2+13*(X>8)
   +13*(X>16)-(X>9),13+X-8*(X>8)-8*(X>16)
   :IF X<10 THEN ? "+0";
GJ 2140 ? X;")":NEXT X
DA 2150 TRAP 2170:FOR X=1 TO 24:INPUT #1,
   A$
UH 2160 Z=VAL(A$(12,13)):POSITION 4+13*(Z
   >8)+13*(Z>16),13+Z-8*(Z>8)-8*(Z>16):?
   A$(3,10):NEXT X
NH 2170 CLOSE #1
JP 2180 POSITION 1,13:? "Which File No.?"
   ;:OPEN #1,4,0,"K:"
KG 2190 GET #1,X:IF (X<48 OR X>57) AND X<
   >27 THEN 2190
ZZ 2200 IF X=27 THEN 2410
DZ 2210 W=(X-48)*10:? CHR$(X);
MR 2220 GET #1,X:IF (X<48 OR X>57) AND X<
   >27 AND X<>126 AND X<>155 THEN 2220
AI 2230 IF X=27 THEN 2410
VB 2240 IF X=126 THEN CLOSE #1:POSITION 1
   6,13:? "  ":GOTO 2180
YN 2250 IF X=155 THEN W=W/10:GOTO 2280
YQ 2260 W=W+X-48:? CHR$(X);
AB 2270 IF W>24 THEN POSITION 16,13:? "
   ":CLOSE #1:GOTO 2180
CY 2280 CLOSE #1:IF D=49 OR D=51 THEN A$=
   "D:*.W":A$(LEN(A$)+1)=STR$(W):OPEN #1,
   6,0,A$:INPUT #1,A$:CLOSE #1
GE 2290 IF D=50 OR D=52 THEN A$="D:*.A":A
   $(LEN(A$)+1)=STR$(W):OPEN #1,6,0,A$:IN
   PUT #1,A$:CLOSE #1
AB 2300 IF A$(5,13)="FREE SECT" THEN F=1:
   X=USR(27588,40520,40959,0):GOTO 2400
UK 2310 F=0
TW 2320 A$(1,2)="D:":A$(13)=STR$(W)
OU 2330 IF D=49 OR D=51 THEN A$(11,12)=".
   W":GOTO 2350
EO 2340 A$(11,12)=".A"
EY 2350 X=USR(27588,40520,40959,0)
IU 2360 IF ((D=49 OR D=51) AND SCR) OR ((
   D=50 OR D=52) AND  NOT SCR) THEN GOSUB
    4200
JA 2370 FOR Z=1 TO LEN(A$):IF A$(Z,Z)=" "
    THEN POP :A$(Z,Z+3)=A$(11,LEN(A$)):A$
   (Z+4)=" ":GOTO 2390
UC 2380 NEXT Z:GOTO 2400
EW 2390 IF W<10 THEN A$(Z+3)=" "
PY 2400 ON D-48 GOTO 2500,2600,2700,2800
AM 2410 X=USR(27588,40520,40959,0):CLOSE
   #1
AO 2420 RETURN
PC 2499 REM LOAD WAVEFORM
GS 2500 IF F=1 THEN POSITION 12,17:? "FIL
   E NOT PRESENT":FOR X=1 TO 200:NEXT X:X
   =USR(27588,40520,40959,0):RETURN
CA 2510 OPEN #1,4,0,A$:POKE 850,7:POKE 85
   2,236:POKE 853,109:POKE 856,20:POKE 85
   7,0:X=USR(ADR(B$),16):GET #1,LTH:CLOSE
    #1
VZ 2520 POKE 27828,LTH:POKE 27998,LTH
ED 2530 GOSUB 3000:RETURN
OJ 2599 REM LOAD ADSR
GU 2600 IF F=1 THEN POSITION 12,17:? "FIL
   E NOT PRESENT":FOR X=1 TO 200:NEXT X:X
   =USR(27588,40520,40959,0):RETURN
EV 2610 OPEN #1,4,0,A$:POKE 850,7:POKE 85
   2,0:POKE 853,110:POKE 856,0:POKE 857,2
   :X=USR(ADR(B$),16):GET #1,NO
KR 2620 FOR X=0 TO NO:GET #1,D:P(X,0)=D:G
   ET #1,D:P(X,1)=D:NEXT X
FL 2630 FOR X=NO+1 TO 64:P(X,0)=0:P(X,1)=
   0:NEXT X:CLOSE #1
EV 2640 GOSUB 3100:RETURN
WF 2699 REM SAVE WAVEFORM
PG 2700 IF F=1 THEN POSITION 12,17:? "Fil
   ename ";:INPUT C$:IF LEN(C$)>8 OR LEN(
   C$)<1 THEN 2700
QU 2710 IF F=1 THEN A$="":A$(1,2)="D:":A$
   (3)=C$:A$(LEN(A$)+1)=".W":A$(LEN(A$)+1
   )=STR$(W)
MY 2720 OPEN #1,8,0,A$:POKE 850,11:POKE 8
   52,236:POKE 853,109:POKE 856,20:POKE 8
   57,0:X=USR(ADR(B$),16):PUT #1,LTH:CLOS
   E #1
EE 2730 X=USR(27588,40520,40959,0):RETURN
VM 2799 REM SAVE ADSR
ST 2800 IF F=1 THEN POSITION 12,17:? "Fil
   ename ";:INPUT C$:IF LEN(C$)>8 OR LEN(
   C$)<1 THEN 2800
QK 2810 IF F=1 THEN A$="":A$(1,2)="D:":A$
   (3)=C$:A$(LEN(A$)+1)=".A":A$(LEN(A$)+1
   )=STR$(W)
IQ 2820 OPEN #1,8,0,A$:POKE 850,11:POKE 8
   52,0:POKE 853,110:POKE 856,0:POKE 857,
   2:X=USR(ADR(B$),16):PUT #1,NO
AK 2830 FOR X=0 TO NO:PUT #1,P(X,0):PUT #
   1,P(X,1):NEXT X:CLOSE #1
EJ 2840 X=USR(27588,40520,40959,0):RETURN
XE 2999 REM DRAW WAVEFORM
ZR 3000 GOSUB 4500:COLOR 1:PLOT 11,4+(15-
   PEEK(28140))*K1:ST=1:C=0
ZA 3010 FOR X=ST TO LTH:IF 11+6*X+C>312 T
   HEN POP :COLOR 0:PLOT 319,79:POKE 88,6
   4:POKE 89,156:POKE 87,0:RETURN
UZ 3020 DRAWTO 11+6*X+C,4+(15-PEEK(28140+
   X))*K1:NEXT X:C=C+6*LTH:ST=0:GOTO 3010
VS 3099 REM DRAW ADSR
CO 3100 X=USR(27588,37264,40463,0)
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ORIGINAL SYNTH

ORIGINAL SYNTH

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LD 3110 POKE 88,144:POKE 89,145:POKE 87,8
   :COLOR 1:PLOT 6,4:DRAWTO 6,74:DRAWTO 3
   13,74:PLOT 313,75:DRAWTO 5,75:DRAWTO 5
   ,4
NM 3120 FOR Y=5 TO 75 STEP 70/5:PLOT 7,Y:
   PLOT 7,Y-1:NEXT Y:FOR X=6 TO 313 STEP
   307/10.24:PLOT X,73:PLOT X-1,73:NEXT X
DJ 3125 IF NO=1 THEN PLOT P(1,0)*K+7,4+P(
   1,1)*K1:GOTO 3160
TN 3130 FOR X=1 TO 63:PLOT P(X,0)*K+7,4+P
   (X,1)*K1:DRAWTO P(X+1,0)*K+7,4+P(X+1,1
   )*K1
ZT 3140 TRAP 3150:IF P(X+2,0)=0 THEN POP
   :GOTO 3160
LR 3150 NEXT X
OS 3160 COLOR 0:PLOT 319,79:POKE 88,64:PO
   KE 89,156:POKE 87,0:TRAP 40000:RETURN
LD 3199 REM CALCULATE ADSR DATA
EI 3200 X=USR(27588,40520,40959,0)
PF 3210 POSITION 3,18:? " PLEASE WAIT - C
   ALCULATING ADSR  "
RF 3220 X=USR(27588,28160,28671,15):C=0
OJ 3230 FOR X=1 TO 63
RK 3240 IF P(X,1)=P(X+1,1) THEN W=USR(275
   88,28160+P(X,0),28160+P(X+1,0),P(X,1))
   :GOTO 3270
OM 3250 Y=P(X,1)
GA 3260 FOR C=P(X,0) TO P(X+1,0):POKE 281
   60+C,Y:Y=Y+(P(X+1,1)-P(X,1))/(P(X+1,0)
   -P(X,0)):NEXT C
JI 3270 TRAP 3280:IF P(X+2,0)=0 THEN POP
   :GOTO 3290
MC 3280 NEXT X
EB 3290 X=USR(27588,40720,40759,0):RETURN
RZ 3499 REM CONFIGURE INITIAL LOAD
EO 3500 X=USR(27588,40520,40959,0)
ZG 3510 POSITION 0,12:? "               CON
   FIGURE BOOT                ":POSITION 14,
   16:? "PLEASE  WAIT"
MR 3520 OPEN #1,8,0,"D:BOOT.DAT":POKE 850
   ,11:POKE 852,236:POKE 853,109:POKE 856
   ,20:POKE 857,2:X=USR(ADR(B$),16)
DS 3530 FOR X=0 TO 64:PUT #1,P(X,0):PUT #
   1,P(X,1):NEXT X:PUT #1,NO:PUT #1,LTH:P
   UT #1,PURE:PUT #1,FX:PUT #1,PEEK(209)
IO 3540 CLOSE #1:X=USR(27588,40520,40959,
   0):RETURN
VL 3999 REM CONVERT LIGHT SHOW SEGMENT
SG 4000 ON (PEEK(209)=1) GOTO 4020
EZ 4010 POKE 27819,56:POKE 27820,233:POKE
    27821,1:POKE 27972,7:POKE 209,1:RETUR
   N
PK 4020 POKE 27819,24:POKE 27820,105:POKE
    27821,2:POKE 27972,3:POKE 209,0:RETUR
   N
VS 4099 REM ALTER SOUND TYPE
UJ 4100 PURE= NOT PURE:RETURN
PE 4199 REM SCROLL
XU 4200 X=USR(27488+47*( NOT SCR)):SCR= N
   OT SCR:RETURN
GQ 4299 REM DISTORTION ON/OFF
VL 4300 FX= NOT FX:RETURN
AG 4399 REM MAKE SOME NOISE!!!
BS 4400 POSITION 23,14:? G$(205,298):X=US
   R(27868+5*(FX=1)-110*(PURE=1)):RETURN
NS 4499 REM WAVEFORM SCREEN SETUP
CZ 4500 X=USR(27588,34064,37263,0)
AJ 4510 POKE 88,16:POKE 89,133:POKE 87,8:
   COLOR 1:PLOT 10,4:DRAWTO 10,74:DRAWTO
   312,74:PLOT 312,75:DRAWTO 9,75:DRAWTO
   9,4
UR 4520 FOR Y=5 TO 75 STEP 70/5:PLOT 11,Y
   :PLOT 11,Y-1:NEXT Y:FOR X=10 TO 312 ST
   EP 302/5:PLOT X,73:PLOT X-1,73:NEXT X
PQ 4530 COLOR 0:PLOT 319,79:RETURN
AY 4540 RETURN
SO 19999 REM INITIALIZATION
DU 20000 GRAPHICS 24:POKE 559,0:SETCOLOR
   2,0,0:SETCOLOR 4,0,0:SETCOLOR 1,0,10:P
   OKE 16,64:POKE 53774,64
TZ 20010 DIM P(64,1),B$(7),G$(573),A$(14)
   ,C$(16):B$="hhh LV ":G$(573)="♥":K=306
   /512:K1=70/15:POKE 729,12:POKE 730,2
TK 20020 OPEN #1,4,0,"D:DATA.DAT":POKE 85
   0,7
FF 20030 FOR X=1 TO 3:READ C,W,Y,S:POKE 8
   52,C:POKE 853,W:POKE 856,Y:POKE 857,S:
   D=USR(ADR(B$),16):NEXT X
QM 20040 POKE 560,0:POKE 561,128
DG 20050 DATA 0,6,205,0,96,107,139,2,0,12
   8,0,1
NL 20060 C=ADR(G$):W=INT(C/256):POKE 853,
   W:POKE 852,C-W*256:POKE 856,61:POKE 85
   7,2:D=USR(ADR(B$),16):CLOSE #1
PC 20099 REM LOAD BOOT FILE
FY 20100 OPEN #1,4,0,"D:BOOT.DAT":POKE 85
   0,7:POKE 852,236:POKE 853,109:POKE 856
   ,20:POKE 857,2:X=USR(ADR(B$),16)
AJ 20110 FOR X=0 TO 64:GET #1,D:P(X,0)=D:
   GET #1,D:P(X,1)=D:NEXT X:GET #1,NO:GET
    #1,LTH:GET #1,PURE:GET #1,FX
OJ 20115 GET #1,X:POKE 209,X:CLOSE #1
FH 20120 POKE 559,34:GOSUB 3000:GOSUB 420
   0:GOSUB 3100:IF PEEK(209) THEN POKE 20
   9,0:GOSUB 4000
CT 20130 POKE 27828,LTH:POKE 27998,LTH:PO
   KE 752,1:POKE 82,0:POKE 88,64:POKE 89,
   156:POKE 87,0
NO 23999 REM MAIN LOOP
ZY 24000 POKE 88,64:POKE 89,156:TRAP 4000
   0
LI 24010 POSITION 0,12:? G$(SCR*40+1,SCR*
   40+39);
YA 24020 POSITION 23,14:? G$(111,204)
PC 24030 POSITION 2,14:? "Sound type :";G
   $(PURE*4+81,PURE*4+84)
HZ 24040 POSITION 2,15:? "Distortion :";G
   $(FX*3+89,FX*3+91)
SU 24050 POSITION 2,16:? "Light show :";G
   $(PEEK(209)*3+89,PEEK(209)*3+91)
ZY 24060 POSITION 2,18:? "Configure Boot"
EQ 24070 POSITION 2,19:? "View ";G$((SCR=
   0)*8+95,(SCR=0)*8+102)
MN 24080 POSITION 2,20:? "Edit"
GJ 24090 POSITION 2,21:? "I/o"
ZZ 24100 CHAN=0:IF SCR=0 THEN XC=8:YC=8:X
   L=20
BK 24110 IF SCR=1 THEN XC=128:YC=8:XL=512
BX 24120 X=USR(1664):GOSUB X:GOTO 24000
```

TURBO BASIC

MAGIC WINDOW

by Les Howarth

Here is a good example of how fast TURBO BASIC can handle players with an unusual effect which could be used in your own programs. You are confronted with a blank screen on which is written an invisible message. As the characters are the same colour as the background you cannot see them. A player missile is used as the 'magic window' to reveal the message. One possible use for this effect would be to create an invisible maze and then use a joystick to move the window in order to find your way round the maze but there must be several other applications.

HOW IT WORKS

Two players are used. Player 0 is used as a frame while Player 2 is used to create the magic glass. Both players are stored in PM$. I should point out that line 10 must be typed in first to ensure that PM$ is the first name in variable name table otherwise the program will not work.

By moving the data within PM$, the players are moved vertically quite fast, so fast in fact that the players are moved from the bottom to the top of the screen instantly. PM graphics are set up in PROC SETUP at line 340. Here is where PM$ is re-directed to the PM storage area. Turbo Basic automatically clears arrays and strings when DIMed but in this instance we need PM$ to be filled with hearts. Line 390 is a quick fill routine which can be used to fill any string with any character. B$ is the shape of the window while C$ is the frame.

There are a few examples included of the special features of Turbo Basic which I will mention in this brief run-down of the program. The dashes in line 100 are obtained just by typing 2 dashes only, when listed you will find all 30 dashes shown. One thing to note, if you want to put in your own message, is that there is a semi colon at the end of each print statement.

Lines 110 to 280 are an infinite loop. The IF statements on lines 180 and 200 are NOT followed by a THEN. Make sure you type the colons where you would expect THEN to occur. The only jump out of this loop appears on line 160. By pressing START, SELECT, or OPTION, the program goes to PROC SLOW on line 300.

The SOUND statement with no parameters turns off all sound. PAUSE is a quick way of producing a delay instead of using a FOR/NEXT loop.

NOW FOR THE MAGIC!

The 'magic' is performed in line 430 where the PRIORITY register is set so that the playfield (in this case capital letters) has priority over Player 2. So there the secret is out! What really happens is that wherever Player 2 is on the screen, the Player only covers the background and not the text thus framing each character.

```
OK 1 REM ******************************
EG 2 REM *     MAGIC WINDOW DEMO      *
XH 3 REM *       IN TURBO BASIC       *
CG 4 REM *       by Les Howarth       *
IZ 5 REM * -------------------------- *
RK 6 REM * PAGE 6 MAGAZINE - ENGLAND *
QQ 7 REM ******************************
GH 10 DIM PM$(1024),B$(38),C$(42),BLANK$(
   42)
OX 20 EXEC SET_UP
DE 30 FOR I=1 TO 2
TM 40   ? #6;" * PAGE 6 MAGAZINE *";
GL 50   ? #6;" *...TURBO BASIC...*";
BY 60   ? #6;" *..MAGIC--WINDOW..*";
QP 70   ? #6;" *...DEMO...DEMO...*";
YX 80   ? #6;" * BY  LES HOWARTH *";
IX 90 NEXT I
OO 100 ------------------------------
VL 110 DO
FS 120   H=1:X=48:X1=44:Y1=536:Y=22
NW 130   PM$(Y,Y+42)=C$:PM$(Y1,Y1+38)=B$
SG 140   FOR Y=30 TO 174 STEP 8:Y1=Y1+8
PT 150     # HORIZONTAL
MF 160     IF PEEK(53279)<>7 THEN EXEC SL
   OW
KQ 170     X=X+H:X1=X1+H:POKE 53248,X:POK
   E 53250,X1
TI 180     IF X>220:H=-1:SOUND 0,8,10,4:G
   O# VERTICAL
SC 190     ENDIF
JB 200     IF X<12:H=1:SOUND 0,16,10,4:GO
   # VERTICAL
MG 210     ELSE
BI 220       SOUND 0,X,8,2
BN 230       GO# HORIZONTAL
RT 240     ENDIF
PV 250     # VERTICAL
MT 260     PM$(Y,Y+42)=C$:PM$(Y1,Y1+38)=B
   $
EH 270   NEXT Y:PM$(Y,Y+42)=BLANK$:PM$(Y1
   ,Y1+38)=BLANK$
RL 280 LOOP
PH 290 ------------------------------
NL 300 PROC SLOW
LX 310   SOUND :PAUSE 3
VP 320 ENDPROC
OW 330 ------------------------------
FA 340 PROC SET_UP
FI 350   GRAPHICS 18:POKE 559,62:I=PEEK(1
   06)-16
RM 360   POKE 704,116:POKE 706,198:POKE 7
   10,0:POKE 712,0:POKE 709,222:POKE 708,
   0
TE 370   POKE 54279,I:POKE 53277,3:VT=DPE
   EK(134)
FT 380   AT=DPEEK(140):OFF=I*256+1024-AT:
   DPOKE VT+2,OFF:POKE 53256,3:POKE 53258
   ,3
YT 390   PM$(1)="♥":PM$(1024)="♥":PM$(2)=
   PM$:BLANK$=PM$
NK 400   B$="♥♥♥♥♥♥♥♥????????????????????
   ??♥♥♥♥♥♥♥♥"
AN 410   C$="♥♥♥♥♥♥♥♥]]]]]]]]]]]]]]]]]]]]:
   ]]]]]]♥♥♥♥♥♥♥♥"
UM 420   Y1=536:Y=22
PJ 430   POKE 623,2
VU 440 ENDPROC
```

YOU CAN DO THIS!

So there's another example of Turbo programming. Can you do better? We'll pay you £20 for a good example of Turbo programming. It must use the features unique to Turbo and be well structured and it must fit on one page. Please also include a brief explanation of the program. Anything will do, but try and make it something that uses the unique features of Turbo Basic.

WHAT IS TURBO BASIC?

Turbo Basic is a new Basic language for the Atari originally published in the German magazine Happy Computing who retain the copyright but have released the program to the public domain. It adds over 60 new commands to Atari Basic, runs three to five times as fast, is totally compatible with Atari Basic and comes with a compiler to compile any Atari BAsic or Turbo Basic program to run at machine language speed. You should be able to get a copy from any source of Public Domain software such as your local user group or the PAGE 6 Accessory Shop.

The DUNGEON

GAME OF THE YEAR!

Alternate Reality
The Dungeon
Datasoft/US Gold
48k Diskette
Price £19.99

Reviewed by John Sweeney

About eighteen months ago I got a copy of a new game called Alternate Reality – The City. It looked very good at first, but in-depth playing of it highlighted many faults and shortcomings. Despite having excellent sound and graphics, and a good basic concept, it wasn't much of a game – just lots of mapping. The documentation did, however, hint at future scenarios and in my review of it back in Issue 21 of Page 6 I expressed high hopes for Alternate Reality if they actually developed it into a game. I have since learnt that The City was actually bought in by Datasoft and hurriedly finished off to meet a deadline – that explains a lot of things.

The Dungeon, on the other hand, was written by Datasoft and properly developed and tested – both as a program and as a game. The result is that they have removed every single shortcoming I found in the City and have produced a superb Role Playing Fantasy Game. It is without doubt the game I have enjoyed most so far this year.

The game starts with your abduction to another reality. You stand before an archway surmounted with ever-changing numbers. You step forward through the archway and the numbers freeze to determine your Stamina, Charm, Strength, Intelligence, Wisdom , Skill, Wealth and Hit Points, plus various other characteristics such as Speed about which you are not given full information.

You find yourself in a Dungeon corridor. The top of the screen has colourful bars displaying your Name, Level, Statistics, Experience Level, Hit Points and Current Location. There is also a small cross spinning to indicate the passage of time. Press P immediately to Pause or time will keep passing and eventually you will be attacked by something nasty! The bottom of the screen contains details of what is going on, all in very readable archaic-looking script. If you are in an encounter with someone it shows a list of your actions – Waylay, Snatch, Leave, Attack, Charge, Aim, Transact (=Talk), Offer, Bluff, Trick, Hail, Switch Weapons, Turn and Run and so on. These are always presented in easy to use lists – just press the corresponding number to choose your action. Anything which a denizen of the dungeon says also appears down here – and some of them have quite a lot to say! As well as the numbered lists of actions, you also have available to you the commands C(ast spell), D(rop Item), E(xamine spells or items = Inventory), U(se an item), P(ause the game), G(et an item), S(ave the current game position), and Q(uit). These are always active where relevant and many of them display lists through which you may scroll F(orwards) or B(ackwards). You can also scroll back or forth through your status screens, using the SELECT and START keys, to view your wealth, current armour and weapons, your apparel, active spells, current curses and diseases.

All of this information appears instantaneously on request and overlays, without destroying it, the current screen contents – all this makes the user interfaces extremely easy to use so that you can concentrate on playing the game rather than trying to fight the programming!

In the centre of the screen is a graphics window which shows your view down the corridor. This is a three-dimensional view of the corridors, chambers, archways and doors ahead of you. As you move, using either the arrow keys on the keyboard, or the joystick, your view of the dungeon scrolls smoothly by. Your compass if you have one appears to the left of this and is updated instantaneously as you turn corners. The details of the stonework make the dungeon most realistic, and this is further enhanced by the clever use of colour to differentiate between various parts of the dungeon. Furthermore many parts of the dungeon, such as the Crystal Caverns and Acrinimiril's Tomb have completely different walls.

The 3-D scrolling was the main feature of the City, in the Dungeon it is far better – smoother, better looking in the distance and more varied.

As you head down the corridors of the dungeon you will undoubtedly encounter various of the inhabitants. It does take about 15 seconds to load an encounter (this is the only pause in the game, apart from a similar load as you enter a new area of the dungeon – all other responses are sub-second). You will then be presented by a picture of the character facing you in the corridor and a list of possible actions.

Your moral behaviour is important in The Dungeon. You will never get far unless you join some of the Guilds and learn their spells. But there are good-guy Guilds and bad-guy Guilds and they will only have you if you conform to their view of morality. Giving food to paupers, not stealing from people you meet, and going to chapel regularly are an absolute must if you want the Guild of Light to have you. On the other hand, if you do do those things there is no way that the Dark Wizard's Guild will touch you with a barge pole! The instructions say that being a good guy is harder in the short term, but brings benefits later. I only tried being a good guy so I don't know what kind of problems you may face later if you are evil, but I can assure you life is not easy for a low level good guy!

Friendly encounters may help you

gain information or enhance your moral standing in the community. Unfriendly encounters usually end in a fight! The fights are fast and deadly. Although you can pause them if you need to think, or speed them up by pressing the space bar, you basically have four seconds to determine your next action before the other guy gets in his next blow or spell. There are a tremendous range of weapons to buy, acquire after fights, or find as treasures in The Dungeon. Choosing the right one to use against a particular enemy may mean the difference between life and death. You must also choose how vicious your attack is – a Charge can do lots of damage but leave you open to attack, an Aim may do even more damage but takes longer, or you may choose to use an artifact – there are dozens listed in the manual and lots more special ones which aren't. There is the Trump Card of Death, the Hypnotic Eye, the Wand of Fear (provided you have a Crystal to power it), the Silver Horn and so on. Or you can use a scroll to enhance your weapon, or, if you have joined a Guild, you can cast a spell. There are over thirty spells listed in the manual, and others which are not! You could try and enhance your armour with a Protect from Evil spell or throw a Lightning Bolt or a Cold Blast at the enemy – again learning which spells are effective against which enemies is critical to your survival! Especially when there is a group of them and they keep summoning their friends to help!

Whoever's Hit Points last longer survives and wins the battle, and to the Victor the Spoils. This is you main way of acquiring the countless artifacts and coins which you will need to survive the game. But the really good treasures come from exploring The Dungeon thoroughly. Hidden throughout The Dungeon are over thirty special artifacts, often guarded by particularly nasty creatures. Some of these items are required to complete Quests in order to finish the game, some enhance your abilities – but you will have to watch your statistics carefully to spot what some of them do, some are superb weapons or armour, some are deadly traps! There are also over thirty special locations where you get a full colour picture of the interior. These include places such as the shop you will find just around the corner from the start, equally useful but harder to find places such as the Dwarven Smithy and the Weapon Enchantress, and numerous places you will need to visit to either learn about or complete various Quests.

The Quests form an important part of the game. You don't need to complete all of them to finish the game, but they are all worth doing – although where they conflict you will need to decide on the right course of action! For instance the Goblin King wants you to retrieve half a dwarven ring which the Trolls have stolen from him. Surprise, surprise, the Troll King want you to retrieve half a dwarven ring which the Goblins have stolen from them! Whom should you trust? Or should you get both halves for yourself? But then what would you do with the halves?

Your final objective (although it is not actually stated in the manual!) is to reach the Doorway to Revelation on the fourth level of The Dungeon. Revelation will be a future scenario of Alternate Reality.

This is not easy. Your first task will be survival. If the monsters don't get you then the diseases, poisons, curses, and deathtraps (like going through a one way wall into a room you can't get out of without a key) will! And don't bank on finding the Fountains which heal, cure diseases and remove fatigue, or the Potion Brewery to help you in the early stages of the game. All these are well hidden where low level characters have no chance of finding them! One place which is worth locating fairly early on is the Dwarven Smithy on the second level – one of the few places you can get money from! Your second task, once you have acquired enough experience points, by destroying the monsters, so that your statistics have increased to an adequate level, is to find enough Gold to join a Guild and learn some spells. Learn Conjure Key early on – there are lots of locked doors!

'should only take a few score hours ...'

From there on you are on your own. The Dungeon is vast and full of interesting problems to tax your ability to map. There are teleport rooms, rotating floors, secret doors and all the usual paraphernalia of dungeons. You will find all sorts of wondrous areas to try and find your way out of – the Taurean Maze, the Loop, Pelinor's Puzzle, the Hall of Mirrors, the Puzzle of the Three Doors, Mordred's Maze, the Room of Confusion and the final and deadly Gauntlet. The Gauntlet is a series of rooms on the third level, each guarded by a powerful denizen, leading to Death's Door – the entrance to the fourth level where you finally solve some of the mysteries of Alternate Reality!

You are provided with a map showing a few of the rooms and corridors near the starting area plus the sewers around the first level (excellent for beating a hasty retreat to the safer areas of the dungeon – but beware, the map isn't entirely accurate!). You will need to map the whole Dungeon in detail to stand any chance of success – and because of the many confusing areas and traps you should always work in pencil on a photocopy! The first level covers 64 × 64 squares – each successive level is a quarter the size of the previous one.

Complete all the quests, join all the appropriate guilds, find all the magical artifacts, fight your way to the fourth level – that's all. Should only take a few score hours if you are good! For a final challenge you could try fighting the dragon on the third level (The Great Wyrm) – the easy way to complete the game is to fulfill the quest the dragon sets you, but he makes for a good fight – he has about 2,000 Hit Points!

You should be aware however that the initial version of the program has a number of bugs in it. If you have a copy that says V2.0 in the bottom right-hand corner of the screen while it is booting then you should immediately apply to your retailer for an upgrade. You must have V2.1 if you want to finish the game. V2.0 had two FBI agents that prevented you from bringing your character in from The City, plus a number of more devious bugs which make it impossible to continue play once you get deep into the game.

There are also a couple of areas in which I felt the game was slightly unfair. Firstly, the Gargoyle's first riddle still doesn't make sense to me so I include here the answer – if you get stuck just go three letters back in the alphabet to work out what it is: VKLSZUHFN.

The second problem is payment; currency in The Dungeon includes Copper, Silver, Gold, Crystal, Jewels, etc. For some strange reason certain inhabitants insist on being paid in a particular currency even though most can be exchanged, e.g. one silver equals ten copper. Some of the denizens are also fairly secretive about what they actually want. You may save yourself a lot of time if you are aware that no-one ever minds being paid too much, as long as it is in the correct currency.

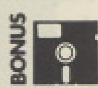
The third problem is the Devourer. This rather nasty beast, can surprise you, suck in your most valuable artifact – without which you cannot finish the game – and when defeated ooze into a mess on the floor with no trace of your artifact. For this reason if no other you should

continued on page 67

DON'T MISS THESE GREAT BACK ISSUES!

PAGE 6 back issues represent an excellent way of increasing the enjoyment of your Atari with articles to enlighten you, programs to type in and reviews of software to guide you. Almost all of the content of past issues will be as fresh and relevant today as when it appeared – increase your enjoyment now, before it's too late! Disks are available for all issues, containing all the 8-bit programs from each issue ready to run, and they often include bonuses not found in the magazine.

ISSUE 20 – GRAPHICS SPECIAL. A super special issue with a graphics theme. Draw some masterpieces with GRAPHICS WORKSHOP and explore your graphics potential with Colour Palette, Picloada, Colour Attributes and CIO Slideshow. An in-depth review of Printshop and Graphics Art Department, the final part of Display Lists and the Adventure column. 11 pages devoted to the ST plus a colour feature ATARI ART and ST GALLERY. And there's more! BLOCKBREAKER is one of the best games to have been published in any magazine. Don't miss it!



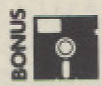
DISK AVAILABLE – includes BONUS PICTURES for Graphics Workshop

ISSUE 21 – A packed issue with games, TRAIN CRAZY, REVENGER and FORKLIFT. Utilities SCALEMASTER, QUICK DISASSEMBLER and Measuring Temperature. Programming hints with Doing The Impossible, Error 8 Solved and THE GUIDE TO ERROR CODES. Reviews of Flight Simulator II, Hitchhiker's Guide to the Galaxy, and the latest Adventures. For the ST a DEGAS to NEO converter, Lattice C reviewed and reviews of a whole host of software.



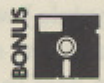
DISK AVAILABLE. All programs ready to go.

ISSUE 22 – More serious users will enjoy SMARTSHEET, a Visicalc like type-in spreadsheet, plus our review of Paperclip whilst gamesters will puzzle over TRICKY CUBES and try to survive HIDDEN DEPTHS. The Guide to Error Codes is concluded and there are articles on Fractals, Tape Problems and some less well known Adventures. Loads of reviews and some great new routines for Blockbreaker. ST users will find out how to program Sprites and can read reviews on Time Bandit, Pro-Fortran 77, VIP Professional and more.



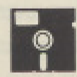
DISK AVAILABLE – DOUBLE SIDED! Contains TWO versions of TRICKY CUBES and new versions of BLOCKBREAKER.

ISSUE 23 – Another superb machine language game WATER SKI SCHOOL will test your reflexes. WORDSEARCH will challenge those who like puzzles and other listings include SUPERCLOWN and the utilities XREF and VERIFY. A huge review of Ultima IV heads a comprehensive review section and Going Online Part 1 will let you know if telecommunications is for you. ST owners can discover how to get a bigger screen on their colour monitor and read reviews of Zoomracks, Sierra On-Line adventures and Pro-Pascal amongst others. Also, is it worth adding a 5¼" drive to your ST?



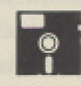
DISK AVAILABLE. Contains TWO BONUS PROGRAMS!

ISSUE 24 – The biggest issue so far published! Great ST section with info about ST disks and cartridges and loads of reviews. For 8-bit users there is MUNCHY MADNESS, the best game we have ever published plus a super cheque book utility AUTOCHECK. Plus all about checking your disk drive, another game called FLYING HIGH, more utilities, reviews of RAMBIT, Adventure games and lots more. Too much in this issue to list fully!



DISK AVAILABLE – Don't miss MUNCHY MADNESS, the best game we have published so far!

ISSUE 25 – Another biggie! A must for 1029 printer owners with 3 great utilities including a SCREEN DUMP. A super Japanese chess game called SHOGI, a type in REVISION C BASIC, a full feature on disks and more. For ST, type in OTHELLO, reviews of LEADER BOARD and MEAN 18, Hints and Tips and several other reviews and articles.



DISK AVAILABLE – ALL THOSE 1029 PROGRAMS READY TO GO!

ISSUE 26 – SOLID MODELLING is one of the best non-game programs we have published. Be creative! Other programs include SOURCE WRITER for machine code programmers, FLEXIBLE FINGERS to help you type, NUTS and more. Reviews of TRIVIAL PURSUIT, DVC/65, SPEEDSCRIPT and much, much more. ST users can learn all about HARD DISKS, FAST BASIC, TYPESETTER ELITE, DEGAS ELITE and read reviews on a whole lot more software.



DISK AVAILABLE – DOUBLE SIDED! TWO virtually full sides with BONUS SCREENS for SOLID MODELLING!

ISSUE 27 – Some cracking listings for the 8-bit. In GREAT BRITAIN LTD. you can be the Chancellor and help run the country. COMPUTER GAMMON is a great Atari version of backgammon and there's ANTS IN YOUR PANTS, DISK COMMAND and others. There is a feature on word processing and stacks of reviews. The ST section includes an in-depth review of ART DIRECTOR and a neat little program to put scrolling stars on your screen! Lots of reviews including HABAVIEW, K-SPREAD 2, K-WORD and many more.



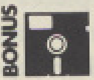
DISK AVAILABLE – some L-O-N-G LISTINGS!

ISSUE 28 – Extend the incredible original Munchy Madness with the MUNCHY MADNESS SCREEN DESIGNER, play GREEDY CATERPILLARS with a friend, teach your children with MOST HEART MATHS or make up some crosswords with XWORD. A long feature on flight simulation programs, hints on ZORK and loads of reviews. For ST users, the first in a series of USING GEM from C plus FLIGHT SIMULATOR II reviews, new books from COMPUTE! and a whole stack of reviews.



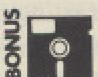
DISK AVAILABLE – Also contains the winning title screen from our competition.

ISSUE 29 – One that serious 8-bit users have been waiting a long time for – a great full feature database – MJDBASE plus an amazing story maker, STORYBOOK, that allows you to create illustrated stories. Then there's a great game from ANTIC called CLIFFHANGER and an AUTORUN maker and more. Cheat on commercial games with ZAPPING THE RIGHT BYTE and read stacks of reviews. The ST section has a type-in program, SCREEN GRABBER, which allows you to 'snatch' pictures of commercial games to disk, plus the next part in our GEM FROM C series and reviews of Superbase Personal, K-COMM 2 plus lots of games including Barbarian. Another big issue.



DISK AVAILABLE. DOUBLE SIDED. With BONUS story for STORYBOOK and STORYBOOK reader.

ISSUE 30 – A great follow up to Solid Modelling allows you to animate 3-D objects. Try 3-D ANIMATOR. How about a puzzle with LETTER CASTLE or an arcade style shoot-up from ANTIC called DESERT CHASE? Articles include an in-depth look at GUNSLINGER, Genealogy With Your Atari and First Steps on saving screens. Loads of reviews including AUTODUEL and P:R: CONNECTION. The ST section includes the continuing GEM series, CYBERSTUDIO, ZOOMRACKS II and loads of games and serious reviews including GFA BASIC, K-Roget, Jupiter Probe and more.



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SAVE frequently. Even worse you will eventually find yourself beset by Devourer after Devourer – hordes of them. There IS a way to get rid of them. And you can do it without moving from where you are – think about it – that's all the help I am giving you!

Finally, the River Stonz. The manual tells you you can cross only at midnight. It would have been much friendlier of them to say 'the midnight hour' – any time where the hours figure is zero.

The only complaint I have about the game is the lack of a proper SAVE routine. The City provided none (yes, you could SAVE, but that ended the game and if you died on your next attempt you couldn't restore again). Datasoft have provided a much better SAVE for The Dungeon, you can SAVE and carry on playing in under a minute, and if you die you are really only LOST and can come back to life. However they obviously don't really like providing this facility so they penalise you by taking a point off one of your statistics and putting you back at the entrance! Since they provide you with a backup utility and recommend you use it they clearly see the need for a proper SAVE. Why then do they not allow it within the game? The game is so deadly you DO need one – so here is how you do it....

Use S(ave) regularly. If you die, switch off and boot up your favorite disk sector editor (I'm sure Page 6 has one in it's library somewhere!). Find the second sector on your Dungeon Character Disk. You should see the names of your (up to) four characters in the sector. The 9th and 13th bytes refer to the first character, the 10th and 14th to the second and so on. The 9th byte will contain FF if the first character is OK, 7F means LOST, or 00 if there is no first character. Just set 7F back to FF and the corresponding byte (13th for the first character) to FF as well. That's all. You can now re-boot The Dungeon and you will find yourself back at your last SAVE position.

As an aside, if you look at the third sector you may spot all of the first character's statistics laid out neatly in hex. You may be tempted to increase them. Shame on you! But don't try it. There are lots of clever check-digit routines built into your character. If you change anything it will notice and refuse to use that character ever again. The only safe bytes to change are between the 9th and the 16th in the second sector – you have been warned!

Alternate Reality – The Dungeon can be played either from scratch, or by transferring an existing character from The City. To provide a challenge for those who bring in a strong City character Datasoft have had to make the Dungeon quite hard. You may find therefore, if you start with The Dungeon, that your first few characters die fairly quickly! Don't despair – be a little nasty, rob a few banks! Your first objective as a player is to learn how the dungeon works and where the magical artifacts are hidden. The game is very well designed in that respect. Once you have mastered enough of it you can start a new character and provide him/her very quickly with some superb weapons and armour at no cost whatsoever. In fact, because of the different increments to your statistics, I suspect you can build a far better character starting from scratch than by transferring from the City.

This is without doubt one of the best games this year and if they keep getting better at this rate then the next Scenario of Alternate Reality is going to be astounding!

So, if you enjoyed The City you'll love The Dungeon. And if you didn't you should have a look at this anyway – it really is excellent.

Nigel Llewellyn shows that Indoor Bowls can actually be fun!

BOWL TRAP

It is the first day of the World Indoor Bowls Championship, when the players' woods (technical term for bowls), decide one by one to cause chaos by running about the different coloured rinks (technical term for play area). It is your responsibility as head umpire to capture each wood by tactically placing bricks on the rinks and trapping them.

PLAYING THE GAME

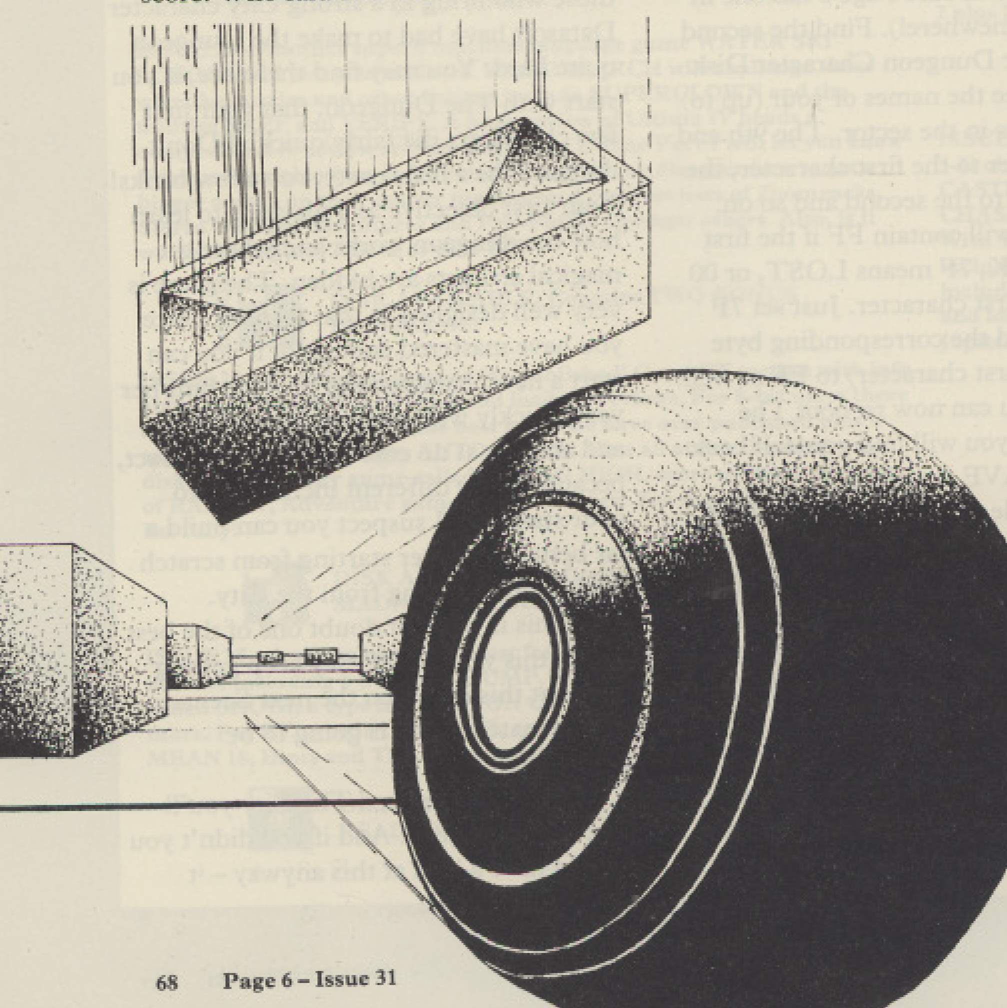
First connect a joystick to port 1 of the computer. The title screen shows the game in action, as played by the computer. The play area is surrounded by a brick wall and is divided into six different coloured segments, which represent the six rinks.

On pressing START the play area will be cleared and a bowl will be placed in the area. By pressing the fire button, a brick will be placed behind the moving bowl. If the bowl touches a brick it will change direction. If the bowl is completely surrounded by bricks and cannot move, it is trapped and the computer will randomly a new bowl in the play area for you to trap.

The coloured segments correspond to different points values, with the middle segments having the most points. Your score is increased by the value of the segment that the bowl was trapped in. Each game requires you to trap twenty bowls.

There are two best score objectives: The highest score and the least number of bricks used.

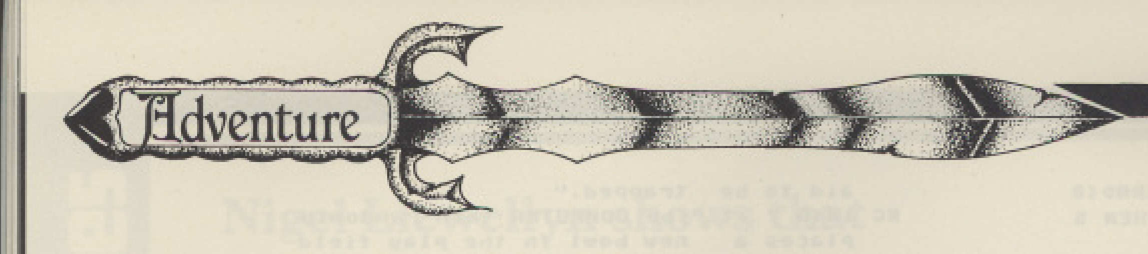
Although simple to play, the game requires a vast amount of practice in the timing of when to place the bricks, as bricks can only be placed while the bowl is in motion. Practice a lot and you will begin to get the idea. You might even get a high score! Who said Indoor Bowls was slow and boring!



```
QK 1 REM ****************************
OA 2 REM *        BOWL TRAP         *
AP 3 REM *           BY             *
SB 4 REM *     NIGEL LLEWELLYN      *
IZ 5 REM * ------------------------ *
RK 6 REM * PAGE 6 MAGAZINE - ENGLAND *
QQ 7 REM ****************************
NN 8 REM
SQ 10 DIM A$(122),B$(122),C$(122),DR(3)
RE 20 C$="
         STEPHENS SOFTWARE welcomes yo
   u to BOWL TRAP.  START TO PLAY, HELP"
YH 30 C$(LEN(C$)+1)=" FOR INSTRUCTIONS"
IV 40 DR(0)=1:DR(1)=-1:DR(2)=40:DR(3)=-40
YS 50 Z=2:N=700:LN=700:SC=300:HS=300
MW 60 POKE 106,PEEK(106)-8:CS=PEEK(106):C
   SBASE=CS*256:GOSUB 1300
XP 70 GOSUB 700:BOWL=20:LINE=70
DX 80 GOSUB 300:GOTO 500
KL 99 REM  MOVE BOWL AND PLACE BRICKS
KL 100 OLDBP=BP:BP=BP+MOVE
JG 110 IF PEEK(BP) THEN SOUND 0,100,10,10
   :MOVE=DR(INT(RND(0)*4)):BP=OLDBP+MOVE:
   IF PEEK(BP) THEN 110
XM 120 POKE BP,2:POKE OLDBP,0:SOUND 0,0,0
   ,0
XT 130 IF  NOT PEEK(644) AND FLG THEN SOU
   ND 1,85,12,10:POKE OLDBP,3:N=N+1:POSIT
   ION 15,23:? N;:SOUND 1,0,0,0:POKE 77,0
DE 140 FLG=PEEK(644)
KP 150 IF PEEK(BP+1) AND PEEK(BP-1) AND P
   EEK(BP+40) AND PEEK(BP-40) THEN GOSUB
   200
LS 160 GOTO 100
HG 199 REM  SCORE WITH TRAP
CU 200 FOR J=120 TO 10 STEP -2:SOUND 0,J,
   10,J/10:SOUND 1,J+J,10,J/10:NEXT J:SOU
   ND 0,0,0,0:SOUND 1,0,0,0
WF 210 IF BP<TL+158 THEN SCR=10:GOTO 270
CD 220 IF BP<TL+278 THEN SCR=50:GOTO 270
IB 230 IF BP<TL+398 THEN SCR=90:GOTO 270
TF 240 IF BP<TL+518 THEN SCR=100:GOTO 270
DG 250 IF BP<TL+638 THEN SCR=60:GOTO 270
EU 260 IF BP<TL+758 THEN SCR=20
HO 270 SC=SC+SCR:POSITION 15,22:? SC;" "
GW 280 POSITION 18+BOWL,20:? " "
GP 299 REM  PLACE NEW BOWL
CS 300 BOWL=BOWL-1:IF BOWL<0 THEN POP :GO
   TO LINE
DR 310 BP=TL+INT(RND(0)*718)+41
WM 330 IF PEEK(BP) OR PEEK(BP+1) AND PEEK
   (BP-1) AND PEEK(BP+40) AND PEEK(BP-40)
    THEN 310
NU 340 POKE BP,2:MOVE=DR(INT(RND(0)*4))
ZJ 350 RETURN
ZZ 399 REM  GAME FINISHES
QD 400 FOR I=0 TO 10
AN 410 FOR J=120 TO 10 STEP -8
UF 420 SOUND 0,J,10,J/10:SOUND 1,J+J,10,J
   /10
NE 430 POKE 708,J:NEXT J:NEXT I
ND 440 POKE 708,0:SOUND 0,0,0,0:SOUND 1,0
   ,0,0
RX 450 GOTO 70
FV 499 REM  COMPUTER PLAYS
KP 500 OLDBP=BP:BP=BP+MOVE
EL 510 Z=2-Z:POKE 755,Z
```

```
LM 520 IF PEEK(BP) THEN MOVE=DR(INT(RND(0
    )*4)):BP=OLDBP+MOVE:IF PEEK(BP) THEN 5
    10
XN 530 POKE BP,2:POKE OLDBP,0
XA 540 IF RND(0)>0.8 THEN POKE OLDBP,3
NS 550 IF PEEK(BP+1) AND PEEK(BP-1) AND P
    EEK(BP+40) AND PEEK(BP-40) THEN GOSUB
    300
AK 560 IF PEEK(53279)=6 THEN GOTO 600
DN 570 IF PEEK(732)=17 THEN GOTO 900
NO 580 GOTO 500
KV 599 REM CLEAR SCREEN/RESET VARIABLES
PO 600 POKE 559,0:FOR I=1 TO 18
HV 610 POSITION 1,I:? "
                      ":NEXT I:POKE 77,0
TJ 620 POSITION 0,20:? " BOWLS REMAINING
    ←→ ●●●●●●●●●●●●●●●●●●●● ";:BOWL=20
YU 630 SC=0:N=0:POSITION 15,22:? "0   ":P
    OSITION 15,23:? "0   ";:LINE=400
LQ 640 GOSUB 300:POKE 559,34:GOTO 100
VR 699 REM  DRAW SCREEN
ZQ 700 GRAPHICS 0:POKE 16,64:POKE 53774,6
    4:POKE 559,0:POKE 756,CS:POKE 708,0:PO
    KE 709,204:POKE 752,1
VS 710 TL=PEEK(88)+PEEK(89)*256
UJ 720 DL=PEEK(560)+PEEK(561)*256
BA 730 POKE DL+2,PEEK(DL+2)+128:POKE DL+3
    ,196
VT 740 FOR I=6 TO 24:POKE DL+I,132:NEXT I
ER 750 FOR I=25 TO 28:POKE DL+I,130:NEXT
    I
FJ 760 MC=USR(1693):POKE 512,128:POKE 513
    ,6:POKE 54286,192:POKE 53248,40:POKE 5
    3249,208
PR 770 POSITION 0,0:? "!!!!!!!!!!!!!!!!!!!!
    !!!!!!!!!!!!!!!!!!!!";
AQ 780 FOR I=1 TO 18:POSITION 0,I:? "!
                                      !";
    :NEXT I
AE 790 POSITION 0,19:? "!!!!!!!!!!!!!!!!!!!
    !!!!!!!!!!!!!!!!!!!!!";
OC 800 POSITION 0,22:? "CURRENT SCORE←→
          HIGH-SCORE ←→":POSITION 1,23:? "
    BRICKS USED ←→          LEAST BRICKS←→";
IE 810 IF SC>HS THEN HS=SC
OC 820 IF N<LN THEN LN=N
MG 830 POSITION 15,22:? SC:POSITION 35,22
    :? HS
YF 840 POSITION 15,23:? N;:POSITION 35,23
    :? LN;
HR 849 REM  WELCOME INTRODUCTION
XJ 850 A$=C$:POKE 559,34:FOR I=0 TO 85:PO
    SITION 1,20:? A$(1,38);:B$=A$(2):B$(LE
    N(B$)+1)=A$:A$=B$
RE 860 IF PEEK(53279)=6 THEN POP :GOTO 60
    0
IF 870 IF PEEK(732)=17 THEN POP :GOTO 900
BI 880 SOUND 1,85-I,10,10:SOUND 1,0,0,0
XV 890 FOR D=0 TO 6:NEXT D:NEXT I:RETURN
KV 899 REM  INSTRUCTIONS
RC 900 GRAPHICS 0:POKE 559,0:POKE 16,64:P
    OKE 53774,64:POKE 82,2:POKE 752,1:?
PQ 910 DL=PEEK(560)+PEEK(561)*256:DL1=DL-
    256
ZX 920 FOR I=1 TO 6:POKE DL1+I,PEEK(DL+I)
    :NEXT I
FD 930 FOR I=6 TO 50 STEP 2:POKE DL1+I,0:
    POKE DL1+I+1,2:NEXT I
KI 940 FOR I=52 TO 53:POKE DL1+I,PEEK(DL+
    I-23):NEXT I
EM 950 POKE DL1+54,PEEK(561)-1:POKE 561,P
    EEK(561)-1
LD 960 FOR I=33 TO 45 STEP 2:POKE DL1+I,1
    30:NEXT I
CW 970 POKE 1713,82:POKE 1714,178:POKE 17
    15,50:POKE 1716,130:POKE 1717,18:POKE
    1718,2:POKE 1719,148
IV 980 POKE 1737,0:POKE 1738,0:POKE 1739,
    0:POKE 1740,0:POKE 1741,0:POKE 1742,0:
    POKE 1743,0
BZ 990 POSITION 0,0:? "                INST
    RUCTIONS                ";
PX 1000 ? :? "BOWL TRAP is one of the mos
    t simple,  frustrating but addictive g
    ames you   will ever play."
XF 1010 ? :? "The idea of the game is to
    trap 20    bowls which roll individual
    ly around  a multi-coloured field."
CF 1020 ? :? "By pressing the FIRE BUTTON
     on your    joystick (0) a brick will b
    e placed   behind the moving bowl."
UR 1030 ? :? "When the bowl cannot move i
    n any of   the four directions it is s
    aid to be  trapped."
RC 1040 ? :? "The COMPUTER then randomly
    places a   new bowl in the play field
    which you  then must trap."
WR 1050 ? :? "PRESS  HELP  FOR PAGE 2":PO
    KE 732,255:POKE 559,34
ZU 1060 IF PEEK(732)<>17 THEN 1060
HU 1070 POKE 559,0:POKE 82,2:? "K":POSITI
    ON 0,0:? "                INSTRUCTIONS
                ";
TV 1080 ? :? "Everytime you press the FIR
    E BUTTON   while the bowl is moving ON
    E brick    will be placed on the ";
QC 1090 ? "play field.":? :? "The button
    must then be RELEASED and  REPRESSED t
    o place another brick."
ZQ 1100 ? :? "Various points are scored d
    epending   upon which coloured part of
     the field the bowl was trapped."
JS 1110 ? :? "The points awarded are give
    n below:-":POKE 82,6:?
PM 1120 ? "PURPLE AREA SCORE  10 POINTS"
UE 1130 ? " GREEN AREA SCORE  50 POINTS"
PB 1140 ? "   RED AREA SCORE  90 POINTS"
RH 1150 ? "  BLUE AREA SCORE 100 POINTS"
JF 1160 ? "ORANGE AREA SCORE  60 POINTS"
JR 1170 ? "  GREY AREA SCORE  20 POINTS"
NH 1180 POKE 82,2:? :? "PRESS  HELP  FOR
    GAME"
LN 1190 MC=USR(1693):POKE 512,128:POKE 51
    3,6:POKE 54286,192:POKE 732,255:POKE 5
    59,34
UO 1200 IF PEEK(732)<>17 THEN 1200
IV 1210 POKE 559,0:POKE 1713,90:POKE 1714
    ,90:POKE 1715,90:POKE 1716,90:POKE 171
    7,186:POKE 1718,186:POKE 1719,186
WA 1220 POKE 1737,84:POKE 1738,84:POKE 17
    39,84:POKE 1740,84:POKE 1741,180:POKE
    1742,180:POKE 1743,180:POKE 732,255
RT 1230 GOTO 70
VE 1299 REM  INITIALIZE
IG 1300 GRAPHICS 2+16:POKE 16,64:POKE 537
    74,64
US 1310 POSITION 5,1:? #6;"BOWL  TRAP"
RM 1320 POSITION 9,4:? #6;"by"
TY 1330 POSITION 2,7:? #6;"nigel  llewell
    yn"
VM 1340 POSITION 6,10:? #6;"(C) 1987"
KK 1350 RESTORE 1500
BH 1360 FOR I=1536 TO 1567:READ A
CI 1370 POKE I,A:NEXT I
QU 1380 MC=USR(1536,CSBASE)
LL 1390 RESTORE 1600
MP 1400 FOR I=8 TO 31:READ A
RP 1410 POKE CSBASE+I,A:NEXT I
LH 1420 RESTORE 1700
AB 1430 FOR I=1664 TO 1763:READ A
CB 1440 POKE I,A:NEXT I
KY 1450 POKE 53261,255:POKE 53262,255:POK
    E 704,0:POKE 705,0
AZ 1460 RETURN
EY 1499 REM  M.C. TO COPY 1K OF ROM
BA 1500 DATA 104,104,133,204,104,133
MW 1510 DATA 203,169,224,133,206,160
ML 1520 DATA 0,132,205,162,4,177,205
SF 1530 DATA 145,203,136,208,249,230
II 1540 DATA 204,230,206,202,208,242,96
HU 1599 REM  DATA FOR NEW CHARACTERS
ID 1600 DATA 255,186,186,255,255,171,171,
    255
AE 1610 DATA 0,20,85,89,89,85,20,0
GT 1620 DATA 255,63,255,255,255,243,255,2
    55
WH 1699 REM  DATA FOR DISPLAY INTERRUPT
NS 1700 DATA 72,138,72,174,156,6,189,176,
    6,141
MS 1710 DATA 10,212,141,24,208,189,200,6,
    141,26
HL 1720 DATA 208,238,156,6,104,170,104,64
    ,1,104
NG 1730 DATA 169,7,160,168,162,6,32,92,22
    8,96
ID 1740 DATA 169,1,141,156,6,76,98,228,0,
    90,90
SW 1750 DATA 90,90,186,186,186,58,58,58,1
    38,138
UE 1760 DATA 138,26,26,26,10,10,10,10,226
    ,228
PE 1770 DATA 226,228,84,84,84,84,180,180,
    180,52
CR 1780 DATA 52,52,132,132,132,20,20,20,4
    ,4
YS 1790 DATA 4,4,226,228,226,228,0,0,0
```

●



20. THE NEVERENDING STORY

Garry Francis gives the background to an unusual adventure in a review that almost matches the title!

THE BOOK

Michael Ende is probably a stranger to English speaking readers, but he is well known in his native Germany. He has worked as an actor, a playwrite, a director and a film critic, but is probably best known for his novels in the 'Jim Knopf' series and the award winning 'Momo'.

In 1979, Ende published a book called 'Die unendliche Geschicte'. It immediately became the number one bestseller in Germany and stayed in that position for three years. It has been translated to many different languages with an English version being published in 1983 as 'The Neverending Story'.

'The Neverending Story' is about a fat little boy of about ten or twelve with the unlikely name of Bastian Balthazar Bux. Bastian is the classic 'fat boy' at school. He is no good at sports or at school work and always gets teased by his classmates.

In the opening pages of the book, Bastian bursts into an old bookshop while trying to escape the local bullies. When the shop owner is distracted by a telephone call, Bastian feels compelled to take a book called 'The Neverending Story'. He runs from the shop as fast as he can, then realises that he can't go to school or go home because he'll be caught for stealing. His only option is to sneak into the school attic where he settles down to read his ill-gained prize...

Moldymoor is slowly being devoured by an all-consuming emptiness known as the Nothing. The creatures of Moldymoor are naturally concerned and decide to send a messenger to ask the Childlike Empress for her help to overcome the Nothing. The messenger is a will-o'-the-wisp named Blubb. Unfortunately, Blubb's sense of direction isn't very good and it becomes lost in the Howling Forest. It finds three other travellers camped in a clearing in the forest and seeks directions from them. The other creatures – a rock chewer named Pyornkrachzark, a tiny named Gluckuk and a night-hob named Vooshvazool – reveal that they are on the same mission as Blubb. It seems that all Fantastica is being consumed by the Nothing and when the messengers realise this, they set off with renewed vigour to find the Childlike Empress.

Six days later, the messengers start arriving at the Ivory Tower – the heart of Fantastica and home of the Childlike Empress. Much to their surprise, they aren't the first to arrive. The High Street which winds around the Ivory Tower is already clogged with messengers wanting to see the Childlike Empress. Unfortunately, no one can see her because she is ill. It seems that the destruction of Fantastica began at the same time as her illness and all are concerned that there is some connection.

The best doctors in Fantastica have examined the Childlike Empress, but none can find a cure for her illness. When the last doctor, Cairon the black centaur, finishes his examination, he announces that a hero is needed to search for a saviour for the Childlike Empress. A Greenskin boy named Atreyu has been selected for the task. He will be given AURYN to help in his quest. This is the badge of someone acting on orders from the Childlike Empress and everyone in Fantastica knows and respects it.

And so it is that Atreyu sets out on his horse Artax in search of a saviour who can cure the Childlike Empress. At the same time, in a different part of Fantastica, the darkness condenses into a great shadowy form – the Gmork!

Atreyu's journey takes him through the Silver Mountains, the Singing Tree Country, the Glass Tower of Eribo, the flaming streets of Salamander, the broad plateau of the Sassafranians, the jungle temple of Muwamath and the Howling Forest where the four messengers first met. After a week's riding, he has a dream which indicates that he should seek Morla the Aged One who lives far to the north in the middle of the Swamps of Sadness.

Atreyu rides to the Swamps of Sadness, but loses Artax in the murky black water. Only AURYN saves Atreyu from a similar fate. When Atreyu finds Morla, she tells him that the Childlike Empress needs a new name to cure her illness, but no one in Fantastica can give her that name. Maybe Uyulala in the Southern Oracle can help, but it's much too far for Atreyu to journey within his lifetime.

Atreyu plods on. After a few days, he finds his path blocked by the Deep Chasm in the Land of the Dead Mountains. An enormous spiderweb is stretched across the chasm and in it struggles a great white luckdragon named Falkor. The luckdragon is being attacked by Ygramul the Many, a monster made up of innumerable small steel-blue insects whose combined form keeps taking different shapes such

as a spider, a hand and a scorpion. Because Atreyu is wearing AURYN, Ygramul reveals that her bite means death within an hour, but the poison also allows one to wish himself to any part of Fantastica. Atreyu lets himself get bitten and wishes himself to the Southern Oracle. Fortunately for Falkor, he overhears Ygramul's explanation and he too wishes himself to the Southern Oracle. Gmork arrives at the chasm a short time later, only to find that his quarry is gone.

Atreyu and Falkor become partners, but collapse under the effect of Ygramul's poison. They awake sometime later in the care of two little Gnomics. Urgl, a healer, has cured them of Ygramul's poison. Her husband Engywook, a scientist, has been studying the Southern Oracle all his life and tells Atreyu about the three gates that he must pass through to get to Uyulala – the Great Riddle Gate, the Magic Mirror Gate and the No-Key Gate. Atreyu sets out and, to cut a long story short, makes it through all three gates. When he hears the advice of Uyulala, he discovers that only a human child from beyond the borders of Fantastica can give the Childlike Empress a new name. With this knowledge, he returns to Falkor and together they fly off in search of the borders of Fantastica.

They fly night and day until they encounter the four Wind Giants – Lirr from the north, Baureo from the east, Sheerek from the south and Mayestril from the west. They tell Atreyu that Fantastica has no borders, but as they start to fight for power, Atreyu loses his hold on Falkor and falls into the sea.

When Atreyu regains consciousness, he finds himself safely washed onto a beach, but he has lost AURYN. He heads inland, only to see the strangest procession of night-hobs, kobolds, ghosts, witches and vampires. He follows the procession until they fling themselves at the Nothing. Atreyu is tempted to follow them but, with great effort, he fights the attraction of the Nothing and runs with all his might in the opposite direction.

He soon reaches the deserted Spook City, where he finds the Gmork, who is now chained up like a whipped dog. The Gmork does not recognise Atreyu and tells him how he can reach the world of humans by leaping into the Nothing, but if he does, he will not be recognised by humans. He will be a lie!

Atreyu now realises why humans have stopped coming to Fantastica to give the Childlike Empress new names. The more of Fantastica that is destroyed by the Nothing, the more lies flood the human world and the more unlikely it is that a human child will visit Fantastica. It is a vicious circle from which there is no escape.

In the meantime, Falkor recovers AURYN from the ocean depths. With AURYN to guide him, he is able to find Atreyu and rescue him from Spook City. Together, the two adventurers fly to the Ivory Tower to report their failure to the Childlike Empress. To Atreyu's surprise, the Childlike Empress considers his quest a success, for his adventures have been shared by a human child who even now is listening to their every word. The human need only call the Childlike Empress by her new name and Fantastica will be saved.

Bastian knows the Childlike Empress is referring to him, but he lacks the courage or confidence to utter her new name. Besides, how could the characters in a book know that he exists?

The Childlike Empress has one last trick up her sleeve. She leaves three of her seven powers to care for Atreyu and Falkor and the remaining four carry her from the Ivory Tower in a glass litter. They travel in silence for many days and nights until they reach a plateau at the summit of the Mountain of Destiny – the highest mountain in all Fantastica. In a smaller, odd-looking mountain in the middle of the plateau she confronts the Old Man of Wandering Mountain. The Old Man does not speak to her, but writes in a book. And as he does so, the events that he records actually happen. For he is the great chronicler of Fantastica. The Childlike Empress, the Old Man himself, Atreyu, Falkor and all Fantastica are recorded in this book. The book IS Fantastica. And its title is 'The Neverending Story'...

This is NOT the end of 'The Neverending Story', for it has no end, just a beginning. In purely physical terms, Michael Ende's book is divided into 26 chapters. Each chapter begins with a letter of the alphabet from A to Z in strict alphabetical order. The Childlike Empress' meeting with the Old Man of Wandering Mountain is not even halfway through the book. There are still over 200 pages to go! In the next few pages, we discover WHY the book is called 'The Neverending Story' – for it truly IS neverending. There's also another great revelation that I'd prefer to keep from you until you read the book for yourself. And you should!

Bastian does eventually call out the Childlike Empress' new name and in doing so, he becomes a part of Fantastica. The remainder of the book tells of his adventures there, the changes in his personality and his battle to return to the human world. If you thought the first half of the book was fanciful, then you ain't seen nothin' yet!

Bastian's adventures take him through Perilin, the night forest and Goab, the Desert of Colors where he befriends Grograman the lion. From here he passes through the Temple of a Thousand Doors and on to the Silver City of Amarganth where he proves his superiority over all others and meets Atreyu and Falkor for the first time.

The three friends set off to find out how Bastian can find his way back to his own world, but he becomes increasingly pig-headed and uncooperative for reasons that I shan't reveal here. As the travellers wander through Fantastica, they build up an ever increasing army of followers who worship Bastian as their Saviour. They have encounters with the Acharis, Xayide the sorceress and the Three Deep Thinkers before eventually reaching the Ivory Tower.

The Childlike Empress has gone, so Bastian sets himself up as the new emperor. The increasing friction between Bastian and Atreyu causes a war between the two. As with all wars, there are no real winners, just losers. The war's culmination finds Atreyu wounded by Bastian, the Ivory Tower in flames, hundreds of Fantasticans killed or wounded and Bastian's followers in tatters.

Bastian rides off in anger until he comes to the topsy-turvy City of the Old Emperors which is inhabited by the Know-Nothings. From here, Bastian's downhill slide takes him across the Sea of Mist to Dame Eyola's House of Change and Yor's Minroud. By the time of his final encounter with Atreyu and Falkor, Bastian has forgotten everything including his own name. It is only with the help of Atreyu and Falkor that he is able to drink the Water of Life and return to his own world.

The book has a happy ending, but be prepared to shed a tear or two, for it's a real tear-jerker.

THE MOVIE

The popularity of Michael Ende's book was so great that it was inevitably turned into a movie. In fact, it was the most expensive film project ever undertaken in Germany.

The film of 'The Neverending Story' was created behind locked doors in the Bavarian studios of Munic Geiselgasteig between 1982 and 1983. It took an international team of fantasy film specialists supervised by special effects guru Brian

Johnson. The end result was a complex combination of miniatures, full size models and elaborate studio sets; puppets, animatronics, mechanical special effects and stunts; matte paintings, sculptures, photographic special effects, special lighting, the biggest blue screen in the world and just about every other trick in the book. Oh, and some live actors too.

The movie is remarkably true to the book, especially considering the technical difficulties of fantasy film making. The scenery, characters, place names, events and even the dialogue are very close to the book, but there are some significant differences. (For a fascinating insight into the making of the movie, see 'The World of The Neverending Story' published by Paper Tiger 1984.)

The pre-production artwork included Blubb in the film, but it was omitted from the final shooting. The other three messengers appeared in the film, but were given the simpler and more pronounceable names of Rockbiter, Night Hob and Teeny Weeny. The land of Fantastica was also renamed to Fantasia.

The Ivory Tower does not appear as described in the book because it could not be built in the studio and all the symbolism would have been lost when photographed. Various ideas were tried before the final concept of a blooming petal was chosen. Cairon does not appear as a centaur in the film, but has a human form and Atreyu does not have green skin.

The storyboards were done for the scene with Ygramul, but the special effects people said it would be too expensive to create. The script was changed so that Falkor could be introduced by rescuing Atreyu from the Swamps of Sadness just before the Gmork got him.

In the book, Atreyu must pass through three gates before he can see Uyulala. Only the first two appear in the film.

The scene with the Wind Giants was not used because the movie's realisation of the Nothing was more impressive than the ghostly personification of the Wind Giants would have been. The scene with the ghostly procession was also left out of the movie, but the essence of the scene was achieved by the reappearance of Rockbiter who had just lost his little friends Night Hob and Teeny Weeny to the Nothing.

The episode with the Old Man of Wandering Mountain does not appear in the movie either. Instead, Bastian calls out the Childlike Empress' new name without her having to make the trip. The second half of the book is not included at all. In fact, it would make a terrific sequel. The film leaves itself open to a sequel by including the closing remark "Bastian made many other wishes and had many other adventures before returning to his world. But that is another story and shall be told another time.".

THE ADVENTURE

Just as the book inspired a movie, so too the movie inspired a computer game. 'The Neverending Story' is a disk-based Adventure which was originally written by Ian Weatherburn and released by Ocean Software Ltd. for a variety of computers. The Atari version was advertised, but I'm not sure whether it actually made it to market. Distribution was later taken over in Australia by Intellicreations under the Datasoft label. This is the version I bought, so that's what I'll review here.

'The Neverending Story' is a traditional text Adventure, but does include some nice graphics in a most unusual screen layout. The top three-eighths of the screen has a 'Cinemascope' picture of the Ivory Tower. This never changes. As you move around the landscape, a smaller window is superimposed over the left hand side of the main picture. The smaller picture shows your current location or a character that you've just encountered.

In a similar manner, every time you pick up an object, a picture of it appears somewhere over the right hand side of the main picture. You can carry five objects and have one travelling companion at any one time, hence you can have up to six little pictures on the right hand side of the screen plus the picture of your current location on the left hand side all superimposed over the main picture.

The remaining five-eighths of the screen is devoted to text. Room descriptions always start with a large fancy letter, but this is NOT in colour as in the screen shots that you may have seen in advertisements or reviews. The text uses a redefined character set which is reasonably attractive, but very difficult to read. This is not helped by some atrocious spelling and punctuation.

One problem with the text portion of the display is that a long room description or a lot of objects in a room can cause some of the text to scroll off the screen before you get a chance to read it. If you don't type anything for about 1 minute 20 seconds, the program prints "You wait!". This happens even if you are in the middle of typing a command and once again, some of the previous information scrolls off the screen. This is very frustrating if you take extensive notes like I do. Fortunately, it doesn't have any effect on the game. It is NOT real time.

The parser allows multi-word input, but its understanding of English is pretty dismal. It has a very small vocabulary and only looks at the first three characters of each word. The whole game can be finished using only one and two word commands, so keep your commands simple to save a lot of trauma.

The game is accompanied by some really horrible music. It is supposed to be the popular Georgio Moroder theme music from the movie, but it is so awful that you'd hardly recognise it. Atari owners deserve better. So does Georgio Moroder.

The music plays incessantly all the way through the game and really gets on your nerves. You can turn the sound down of course, but then you lose the keyboard click. I like to have the keyboard click, so I did a bit of experimenting and discovered an undocumented command to turn the music off. Just type NOMUSIC (without any spaces) to turn it off and MUSIC to turn it on again.

I should also point out that the disk is copy protected, so you can't (theoretically) make a backup. Bad move Datasoft! As a hardened computer user, I know never to use an original disk without having a backup, so I cracked the copy protection and made a backup just on principle. In doing so, I made some interesting discoveries. Most importantly, the game switches out the Operating System and loads its own (which is just a rip-off of Atari's anyway), hence it will not run on the older Atari 400/800 computers. Another bad move Datasoft!

The plot is remarkably close to the movie. You could probably complete the game without having read the book or seen the movie, but it would certainly be harder to play and wouldn't make much sense. You really need to be familiar with the storyline and, to a lesser extent, the philosophy imbedded within the story. That's why I've gone to so much trouble to summarise the story in this article. .

The Adventure is divided into three parts, each being loaded from disk when needed. The first part covers Atreyu's adventures up to the Southern Oracle and includes most of the important events from the movie. However, it is chock full of red herrings and some of the events in the movie can be avoided

Garry Francis' ADVENTURE HINTS

without affecting your completion of the game. The aim is merely to get to the Southern Oracle.

The second part leads you to Spook City where you lose AURYN and Falkor. This part is considerably different to the movie, as it covers very little of the story and has lots of new objects and locations. This is probably a good thing from the Adventurer's point of view, as this part of the game has the best puzzles. The aim is to find the golden key. This is not terribly difficult except for some really horrible bugs in the game. For example, you can go up from the library even if the planks haven't been removed. There are situations where you can get killed in the darkness even though the glowglobe is present. You can pick up the pouch a number of times and have the coin appear more than once. You can get the key from the box-shaped room without killing the rats, although I won't tell you how. The logic behind the spider web doesn't make sense. It blocks a different exit depending on which way you enter the room.

Anyway, once you've found the golden key, Falkor will reappear. All you've got to do is find him and you're ready for part 3.

The third and final part takes you to the Ivory Tower where your aim is to return AURYN to the Childlike Empress. This part is fairly easy because there are hardly any puzzles. However, there is a large, three-level maze which is a bit tricky to map. The horizontal directions don't present too much trouble, but some of the vertical directions are a real pain. Don't be surprised if you go up a stairway and find yourself at the level below!

Overall, 'The Neverending Story' is a bit of a disappointment. It has a poor parser, a limited vocabulary, terrible spelling, grammar and punctuation, dreadful music and quite a few bugs. Despite this, it is enjoyable in a perverse sort of way. It is fairly easy to solve if you've read the book or seen the movie, but it's probably not a good game for beginners.

Fortunately for Datasoft, there are Adventure addicts like me who will always buy new Adventures no matter how good or bad they are. Maybe we're just stupid!

HINTS

I haven't had any coded hints in the last couple of issues, so here's a quick note on how to use them for the benefit of the newcomers. First of all, scan through the questions until you recognise one which describes the point where you're stuck. Then match the numbers with the words in the attached list to get a hint. Simple, isn't it?

Next Issue

Everybody's heard of 'The Pawn'. It has been heralded as the greatest Adventure of all time – "... brilliant graphics ... superb parser ... better than Infocom ...". Bull dust! It's more like the greatest swindle of all time!

Lots of people have been conned into buying 'The Pawn' (not by Page 6) only to find that the game is full of bugs, the parser is not so crash hot and the puzzles are unfair. More people are requesting help with 'The Pawn' than anything else currently on the market. So, if I can finish the rotten thing by next issue, I'll have a full list of hints to help you out of the trouble spots. See you then.

Garry Francis, 26 Baringa Road, Earlwood, N.S.W. Australia 2206

THE NEVERENDING STORY

PART 1

1. Don't know what to do here?
5 29

2. Feeling weak from the Swamps of Sadness?
16 75

3. Can't save Artax?
63 33 49

4. Can't survive the quicksand?
8 56 24

5. Can't use the black velvet cape?
81 4

6. Can't find the Southern Oracle?
8 20

7. Can't find Falkor?
12 43

8. Still can't find the Southern Oracle?
53 28 73 76

9. Can't get past the sphinxes?
39 15 62 51

10. Can't find the crystal?
23 35

11. Can't enter the tunnel?
2 54

12. Still can't enter the tunnel?
72 7 82 68

13. Can't open the glass box?
27 26 1 38 78 42 76

14. Can't get the small fragment of glass?
37 34

15. Still can't get past the sphinxes?
18 71 47 62 9

PART 2

16. Can't find AURYN or Falkor?
23 13 36

17. Don't know what to do here?
5 52

18. Keep getting killed by the Nothing?
14 69 74 17 22

19. Can't get the planks?
59 47

20. Can't work out what the paper means?
81 4

21. Can't see in the dark?
37 65

22. Can't get down the well?
37 57

23. Can't open the cell door?
46 80 50

24. Can't get past the rats?
55 48 74 67 30

25. Can't survive the spider's poison?
16 32

26. Can't get past the spider's web?
40 25 6

27. Getting killed by the wraith torturer?
8 56 24

28. Haven't found the golden key?
58 10 77

29. Still haven't found the golden key?
67 58 38 66 19

30. Can't find Falkor?
23 61 79 44 64

PART 3

31. Don't know what to do here?
39 3 62 21

32. Can't open the enormous wooden door?
60 41 45 60 50

33. Can't find a use for all the treasures?
37 62 14 31

34. Can't open the small ornate door?
70 11

35. Is the Childlike Empress disappointed with you?
3

1 LIVE	22 PERSISTENT	43 HORN	64 CITY
2 BURN	23 TRY	44 SPOOK	65 GLOWGLOBE
3 AURYN	24 QUICK	45 NEEDS	66 TORTURE
4 HERRING	25 WITH	46 RATS	67 DROP
5 FIND	26 WHO	47 THEM	68 CAMPFIRE
6 KNIFE	27 PEOPLE	48 TIN	69 CAREFULLY
7 BRANCH	28 SOUTH	49 HIM	70 SAY
8 GET	29 MORLA	50 KEY	71 FOR
9 BLINK	30 NEARBY	51 ENGYWOOK	72 LIGHT
10 IS	31 MAZE	52 BOOK	73 FROM
11 PLEASE	32 APPLE	53 FLY	74 AND
12 BLOW	33 TAKE	54 BUSHES	75 FOOD
13 AGAIN	34 LEATHER	55 OPEN	76 ...
14 MAP	35 TUNNEL	56 OUT	77 CIRCULAR
15 CRYSTAL	36 LATER	57 ROPE	78 GLASS
16 EAT	37 USE	58 COIN	79 OVERLOOKING
17 BE	38 IN	59 REMOVE	80 ARE
18 WAIT	39 GIVE	60 GOLD	81 RED
19 CHAMBER	40 CUT	61 HILL	82 AT
20 FALKOR	41 LOCK	62 TO	
21 EMPRESS	42 HOUSES	63 DON'T	

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THE EDITOR
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Contact

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PEN PALS WANTED: I own a 130XE, 1050 Disk Drive, 1029 Printer and enjoy making add-ons for my computer. I would like pen pals from U.K. and Europe to swap hints and tips. Write to Simon Jenkins, 1 Greenwood Road, Victoria Village, Abersycham, Pontypool, Gwent, South Wales, NP4 8QA

FROM HOLLAND: Many of my former friends are switching to the ST, I would like to find new friends in the 8 bit field. I am interested in swapping info, ideas, p.d. software. Will answer all letters. George van den Eijkel, Diemerkade 13, 1111 AB Diemen, Holland

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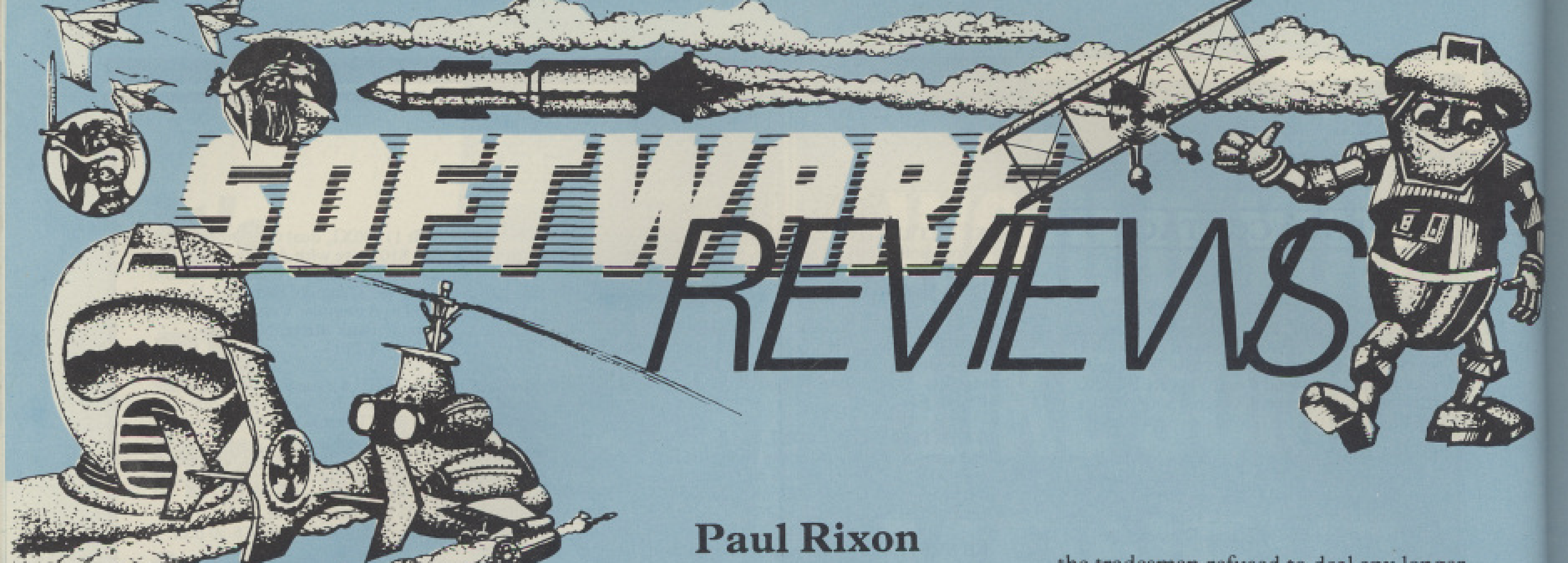
1050 DRIVE: Must be in good working order and at a reasonable price. Phone Gosport 584418. Mrs M. Hamlyn

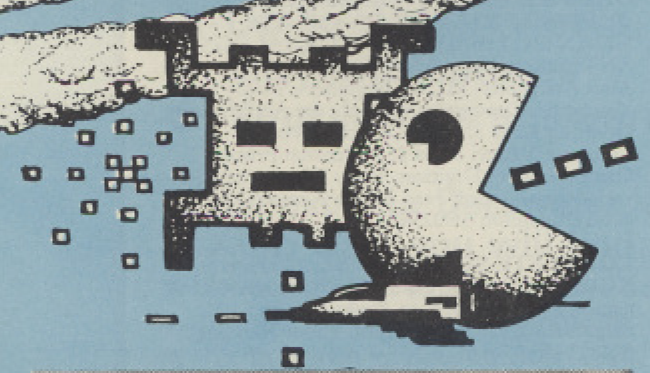
HARDWARE: Any Atari bits, dead or alive, S/ware, Books, Mags etc. wanted. Contact Mr. Shephard, 98 Western Rd., Brentwood, Essex, CM14 4SS

8-BIT SYSTEM: 130 XE and 1050 wanted. Cash/exchange. Ring 0822-852796

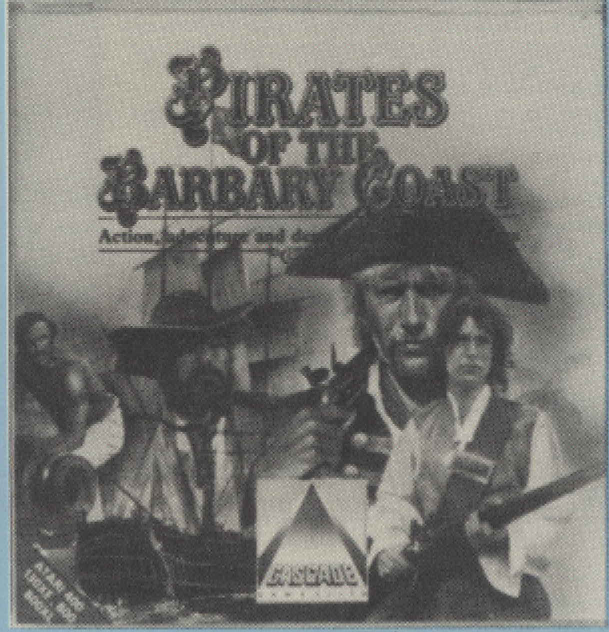
1050 DRIVE: Somewhere in the £50 region. Also 1029 printer around £50. K. Scotney, Pant-y-Saer, Bwlch, Tynygongyl, Anglesey, Gwynedd LL74 8RG

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Paul Rixon meets Pirates ... Droids and Snooker Players!



PIRATES OF THE BARBARY COAST

Cascade Games
Disk £9.95/ST Disk £12.95
1 player/ 1 joystick

"Whilst docked in Casablanca, your ship is attacked and plundered by 'Bloodthroat the Pirate', a blood-thirsty rogue who terrorizes the seven seas. He has taken your daughter Katherine and demands 50,000 gold pieces for her safe return."

And so the scene is set for PIRATES OF THE BARBARY COAST, a new trading simulation from Cascade Games in which you have just thirty days to raise the necessary ransom to secure the release of your daughter, by dealing at the various ports along the African Barbary coast, or better still, putting a stop to the evil wrong-doings of the notorious Bloodthroat. Impressed by this dramatic build-up I donned my skipper's cap, boarded the 'American Star' and ventured forth into the great unknown.

Following the loading procedure and a title page with apt musical accompaniment, I was invited to read the ship's log (which served to reiterate the instructions) and was then presented with a map of the Barbary coast and nearby islands. Underneath the map, data relating to my available supplies and current location was shown, and this was updated on subsequent access to the screen. Having chosen my destination by positioning an arrow over the required port, I confirmed my selection, and waited while the disk revolved for what seemed like an eternity (Cascade obviously recognise this problem as they suggest making notes in the interval!).

A seemingly useless picture of the ship's cannon eventually appeared with the prompt 'To Port'. Selecting this induced yet another lengthy disk access and finally a greeting from Thoresen the master tradesman from Tangier, plus the option of visiting the stores, having the ship repaired, trading at the port or moving on to the next location. Well, as it is a trading simulation I decided to 'do business' at the port and the display switched to a cross-sectional view of the ship's hold. Positioning an arrow cursor over an item in the hold, such as Medicine, Silk or Cocoa, revealed a 'window' and an offer for the goods in question. It was then up to my skill and judgement (ha!) in deciding whether to accept or refuse the offer, or to dicker for a better deal. Naturally choosing the latter option, I was allowed a two gold piece increase, but on pushing my luck too far the tradesman refused to deal any longer. After offloading the remainder of my cargo and undoubtedly getting ripped off in the process, I paid a visit to the buying market which was much the same as the selling one, except of course that I had to haggle for lower prices rather than higher ones. A few gold pieces (gp) lighter in the pocket, I took my chosen stock of Wool back to the ship and decided to check out the stores.

Here, there was food, news and cannonballs for sale, as well as extra crew members for hire. I stocked up with Red Herring sandwiches and attempted to obtain the news, upon which the storekeeper demanded a 900gp bribe for the privilege! By now I was bordering on skint and credit was strictly forbidden, so I set to sail and arrived at the next 'exotic location' where I hoped that someone would appreciate the Wool I had brought them. Good news! Wool was in high demand and I netted nearly 22000gp for the kitty! Investing all of this in Silk turned out to be a wise decision, as I later managed to flog this for a cool 40000gp! What an easy life, I thought, foolishly spending the whole caboodle on Tobacco and discovering a potential loss in store at the next port. It was better luck at the following location, where my financial assets rose to just 500gp short of that magic ransom figure. This was soon put right in a quick deal on Medicine.

Already I had raised sufficient funds to pay off Bloodthroat, so having stockpiled plenty of nosh for the crew I made for the islands, where it was rumoured Bloodthroat lie in waiting. Sure enough, there he was and I was asked whether I wanted to confront him in battle (in which case, what would happen to Katherine I wonder?) or hand over the readies. Anything for a quiet life I thought, and reluctantly parted with the cash only to live happily ever after within the colourful confines of the highscore table. That is, until the computer was switched off because although the drive tried desperately to permanently record my achievement, side B of the disk hadn't been notched!!

Okay, so that was the game, now where's all the 'Action, adventure and derring-do on the high seas' claimed in the sales hype? Well, what I haven't mentioned is the battle which can take place if you are lucky enough (!) to meet a Pirate on your travels. It must have been the Pirates' day off when I played the game, but I can reliably inform you that there is occasionally a battle – although you can choose to flee from it – and if you manage to sink the enemy you can either pick up the ship's accumulated booty or read its log for clues.

A battle consists of firing rather feeble looking cannonballs at the Pirate ship as it sails across the horizon. You have to select the cannon elevation in a very similar fashion to the battle scenario in 'Beachhead I', that's if you manage to load one or all of the fifteen cannons in time. This sequence involves selecting load, cannon, powder, cannon, push rod, cannon, brush, cannon, elevation, cannon and fire in precisely the correct order – realistic as it may or may not be, it certainly becomes extremely tedious after a short while, especially as the cannons seem to automatically unload themselves when you exit the screen. As I have already discovered though, you can sail away from potential conflict in the safe knowledge that it's just as easy to complete the game without the bother. This can also be said for the 'treasure', that is supposedly located on one of the islands. Searching for it can expose the crew to disease, and since they are expensive to replace it's not a good idea to make the effort.

So, having made it into the highscore table you can either have another go or better still, turn off and try something a little more exciting – like Yoga or Chess for instance! Giving credit where it's due, I should mention that each of the locations is nicely drawn in graphic adventure style (although they do tend to get obliterated by the pop-up windows!) but I'm afraid the sound is little more than adequate and, in contrast to the over-imaginative blurb, the game plays somewhat sedately.

Whilst it is certainly an ethical improvement for Cascade Games since the days of their ill-reputed 'Cassette 50', PIRATES OF THE BARBARY COAST is unlikely to appeal to any but the youngest of Atarians. Full marks for an original concept, but not quite the action-packed strategy extravaganza I was expecting!

An ST version of the game is available but I have not seen it. I suspect that the graphics may be better but that the game is very similar in play. •

DIZZY DICE

Players
Cassette
£1.99
1 player
1 joystick



DIZZY DICE is a computer fruit machine played like a conventional fruit machine, which obviously means spinning the reels in the hope that they will display a winning combination of symbols when they come to rest. In the unlikely event of a win, you can opt to pocket the prize money or alternatively throw discretion to the wind and gamble for a higher amount. This feature is implemented by a 'roulette wheel' (looks more like a rotating sundial to me!) – you must correctly predict the symbol on which the wheel will stop to collect the bonus. It's up to your gambling sense whether to go for a higher bonus or a more probable outcome.

All the usual features are included such as Hold, Collect and Gamble, with the exception of Nudge. An additional feature is the 'dice game' in which you can win up to $200 by guessing whether a throw of the die will yield a higher or lower outcome than the last, or if it will be the same. Also, you can select either normal or bank mode at the beginning of the game. In bank mode you commence play with $20 and try to increase it to $100 – to break the bank! Achieve this and the bank limit is increased on subsequent successes up to a maximum of $1000.

If you dislike games that involve a lot of screen changes, you'll be pleased with DIZZY DICE as all the main functions are crammed (crammed being the operative word!) into just one screen, this being reasonably well laid out with a notably liberal use of colour. The use of sound however, is rather less than spectacular with the instruction page and endgame sequence accompanied by the most awful racket you are ever likely to hear! Incidentally, the inlay card illustrates a screen shot showing a cartoon style view of the fruit machine, although it doesn't actually seem to appear in the Atari version. Methinks it's about time the Trading Standards people put a stop to this misleading practice.

To sum up, DIZZY DICE doesn't offer anything radically new over Mastertronic's 'Vegas Jackpot' or indeed the multitude of type-in listings that have appeared in various computer magazines over the years, but for compulsive gamblers with a cash flow problem it is a reasonably entertaining alternative to bankruptcy. And at this price, you can afford to take a gamble! •

L.A. SWAT

Mastertronic
Cassette £1.99
1 player
1 joystick



A terrorist gang has taken over the West side of Los Angeles and it's up to you, as Special Weapons And Tactics (SWAT) team leader, to defeat the baddies and rescue the hostages.

First of all it's a vertically scrolling trek (Gunlaw style) through downtown L.A. where you may just notice the odd yobbo hurling a grenade in your direction. Sidestep these, but watch out for snipers taking pot-shots as you pass, and don't get too near to a terrorist – a close encounter can be an extremely painful experience! Your machine gun is going to get a lot of use on this mission, but you must be careful not to blow away any innocent civilians.

Eventually you'll make it to a crossroads where a quick reaction time will prove to be a useful asset, as the baddies mount a final desperate attack. After a while a captor will appear clutching the hostage, and you've got to blast him away from the scene without harming the victim. Then it's on to the next level where the gang have now recruited new members, ensuring plenty more action to keep you occupied. The blurb mentions something about appearing on Network Television, but whether this is an actual feature of the game remains to be seen.

L. A. SWAT may not be in the best possible taste but it's a reasonable, uncomplicated commando shoot 'em up with moderate graphics, adequate sound and a mild addictive quality. It's bound to do well at the price. •

ARKANOID

Imagine
Cass. £8.95/Disk £12.95
1-2 players
1-2 joysticks/ paddles/ keyboard

Anyone for Breakout? Yes folks, whack-a-brick, bounce-a-ball fever is back upon us, courtesy of Imagine.

Forget all the blurb on the inlay card regarding space ships and suchlike – ARKANOID is essentially an enhanced version of the Atari classic. For the uninitiated, the program displays screen after screen of multicoloured bricks which are destroyed when they come into contact with the ball. This bounces around the play area rebounding off of the bricks, the three perimeter walls, and a fourth, much shorter 'wall' – better known as a bat. You have to position the bat in the path of the oncoming ball – otherwise a life is lost – and ultimately eradicate all of the bricks to progress onto subsequent levels.

Doesn't sound like much of a game by today's standards, right? That's why Imagine have thrown in a few extra goodies along the way. Selected bricks, a large proportion in fact, conceal round capsules and if you destroy the appropriate brick, the capsule floats downwards presenting you with the opportunity to catch it and benefit from one of several special effects, depending on the colour of the capsule and the letter it bears. For example, a 'P' lets you have a bonus life, an 'E' elongates the bat and an 'L' transforms the bat into a twin laser-firing attack ship.

Constantly emerging through one-way doors at the top of the screen are a varied selection of niggling nasties. The animation of these is excellent, but it's not a good idea to admire the graphics for too long – if the ball touches alien matter it is deflected in a random direction at increased velocity. Thirty-two levels later you are given the chance to confront the 'Dimension Changer', or so I'm told! The playfield is very colourful boasting a highly patterned and very imaginative backdrop, although the bat and ball are slightly disappointing, as are the bricks which are simply solid blocks of colour. There isn't any music (pity about that) but the few existing sounds are of reasonable quality and suitability.

The game's overriding strength lies in its immense addictiveness, and if you consider this property to be more important than its originality factor then you should turn a blind eye to the perhaps over-inflated asking price and waste no time in adding ARKANOID to your arcade collection. •

POWERDOWN

Mastertronic
Cassette
£1.99
1 player
1 joystick

Can you destroy the isolated asteroid fortress of inter-galactic arch-villain Argon and put a stop to his evil antics once and for all? You can find out by purchasing POWERDOWN, a game which comes from the keyboard of Graham Askew. If the name sounds familiar, that's because his work has appeared in past issues of PAGE 6 (remember Gangsters and Supply Blaster?). He has now advanced into the wonderful world of commercial programming with this game, which adds to the ever-growing list of bargain titles from Mastertronic, who are presently the most prolific publishers of budget priced software for the Atari.

POWERDOWN is a game of the vertically scrolling arcade genre combining a mild dose of the well-tested shoot 'em up philosophy with a requirement for strategic skill, a degree of dexterity and just a sprinkling of good fortune. Your aim is to infiltrate the fortress, to destroy Argon and to shut down the power source by manoeuvring your trusty space ship through numerous screens (in your own time), negotiating the inevitable defence system and zapping at appropriate moments.

Naturally, Argon's fortress is zealously guarded against penetration by his invincible army of Argoniks together with death rays, lasers, gunfire and combination locks. However, the Argoniks turn out to be a blessing in disguise as they transform solid white walls into zappable red ones. They can also be confined to specific areas of the fortress by tactical opening and closing of doors and are needed ultimately in order to gain access to Argon's control room. 'Shields' are also a necessity and their deployment is crucial to success in the game. An ingenious and possibly unique feature is the 'television scanner' that is used to discover a combination lock code – it took me quite a while to figure out the meaning behind this one! Although sixty minutes is the time limit allowed, I

ON CUE

Mastertronic
Cassette
£2.99
1-2 players
1 joystick



Not one game but two this time from Mastertronic in a package aimed at all you green baize enthusiasts out there who are too tired to hazard an expedition to the local snooker hall and haven't enough room for a real table due to all that precious Atari equipment!

ON CUE completes the hat-trick of snooker simulations for the 8-bit Atari and also includes Pool as a separate, though virtually identical program. No need for me to explain the rules, suffice to say that all the regular ones apply and Mastertronic have included a vague outline of these on the inlay. Dealing with Snooker first, the table is not green as you might expect but black for reasons of clarity, and as with 'Steve Davis Snooker' by CDS, this choice of colouring works well and is preferable to the bright green of the first Atari Snooker simulation by Thorn EMI. In case you're wondering how the black ball is distinguished from the black table, this is achieved by a white circle around its circumference. The yellow and brown balls look suspiciously like different shades of green to me, but otherwise all are reasonably recognizable (unless you've got a black and white television of course!). A rather blocky cushion in bright red has an adverse affect on the visual 'feel' however.

Playing a shot involves positioning a small cross-hair cursor over the point at which you intend to aim the cue ball, setting the desired ball-spin and power level, and finally hitting the trigger whilst simultaneously crossing your fingers in expectation that the ball may, unusually, travel in the required direction. There's no telling really, so you might as well adopt my own established strategy of hitting the cue ball at full power into the object ball and hoping that it will end up in a pocket!

Talking of power, the program seems to assume an exceedingly over-cautious

managed to complete the mission in around half an hour (real time) but not, I hasten to add, before a great deal of practice and experimentation!

In a welcome departure from normal Mastertronic policy, the instructions are very informative and I'd be more than happy to see this practice adopted in their future releases (Mastertronic are you listening?). Sound effects in the game aren't worth throwing a party over, but they're on a par with the majority of recent budget titles, and the graphics are very good indeed! Animation is in abundance without any sacrifice to response time, the scrolling is 'typical' Atari (superb) and there's plenty of colour and detail.

Although I could criticize the slightly irritating delay encountered when obtaining a new ship and the lack of an abort facility, these are really only insignificant points in a game oozing with playability. What's more, POWERDOWN is thoroughly addictive, reasonably challenging and if that isn't enough, will only set you back a mere £1.99! I can't think of any better reasons to immediately rush out and buy it, can you? •

MISSING ... ONE DROID

Bug-Byte
Cassette
£2.99
1 player
1 joystick



Despite their experience, Bug-Byte are not a company noted for exceptionally high quality software and they have yet to produce a serious threat to their competitors in the battle of the budget barons, although their last release – CHICKEN CHASE – was a step in the right direction. MISSING ... ONE DROID is Bug-Byte's latest offering and has been released under licence from Analog. The author – Paul Lay – is no stranger to PAGE 6, and you will undoubtedly remember his fantastic game 'Munchy Madness' that appeared in issue 24.

This one is written entirely in machine code (not an obvious statement to make when discussing Bug-Byte!) and boots up from cassette in around one hundred seconds. A disk version is also mentioned on the inlay, which hardly seems necessary for such a short amount of code. Now for the customary elaborate story, which tells of how Rusty the Droid has become separated from his Droid companions due to his impetuous tendencies – he has foolishly manipulated himself into a topo-dimensional converter and promptly disappeared into a construct universe!! Intuition tells him that if he keeps active and fights off the assailants, the construct universe will become over-stressed and reality inertia will flip him out of the construct and back to his pals in the real world!

Onto the game itself, which runs in a similar vein to 'Robotron 2084' and opens up with a title page almost identical to the 'Munchy Madness' one, complete with scrolling starscape, reverberating colours and futuristic sound track. A press of the START key reveals Rusty, in a blank void, all alone (ahh!). Enter the wicked baddies, right, left and centre, whose only intent is poor old Rusty's destruction. This is where you enter into the plot, guiding Rusty around the screen to avoid various aliens, and blasting them with Photon missiles at every available opportunity. Clear one screen and it's onto the next level of increased difficulty.

That's really all there is to it. Each collision with a pursuer decreases your score and energy level, whilst a successful hit increases the score, and extra energy may be obtained by collecting heart symbols. The existing graphics are very well done but are lacking in quantity and variety, with large and clearly detailed PMGs, together with the scrolling starscape, adding interest to an otherwise forgettable scene.

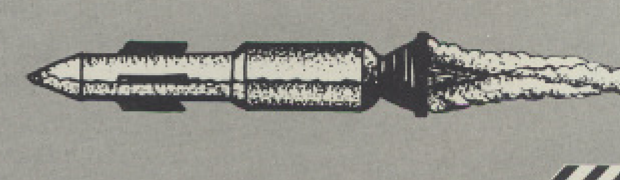
I can only describe MISSING:... ONE DROID as a competently programmed revamp of an aged game concept that would merit unreserved praise as a magazine listing, but one that is far too simplistic and monotonous to warrant a 100% recommendation in today's competitive budget market. Apologies, Rusty! •

attitude towards its use. Consequently, even at full blast the cue ball struggles to travel the length of the table. It also has the annoying habit of suddenly accelerating after a collision, which doesn't say much for the realism but admittedly comes in handy on occasions! Nine levels are available at which to play the computer – level one ensures a computer blunder every time whilst level nine won't give you a look in if you so much as dare to miss a single pot! At times the computer is a little long-winded in deciding on its shot, although perhaps this is intended as a touch of deliberate realism?

You can always choose to play against a human opponent – although you'll have to share one joystick as there is no provision for a second one to be used – or you can watch the computer battle it out against itself. No prizes for guessing who the winner will be, but if you can re-create some of the 'impossible' pots the computer is capable of you should give up arcade games immediately – there's a hefty cheque waiting to be won at the next international competition! If not, never fear, for there is a chance to get your own back, as an edit facility enables the setting up of balls in any desired formation and game continuance from this point. This opens up all sorts of possibilities, such as re-living famous situations, practicing your potting technique and of course, setting up the table in your favour in an attempt to beat the computer! When you can't beat 'em, cheat 'em!!

Pool is based around the same program as Snooker, except of course that the balls are coloured in accordance with the game requirements, and all of the appropriate rules apply. I discovered a slight bug whilst messing about in Pool edit mode when I suddenly found myself with four cue balls on the table, followed shortly afterwards by an irreversible lock up, although I've tried this option since without any such drama so it would not appear to be a major problem.

Having compared ON CUE snooker with 'Steve Davis Snooker' it is apparent how remarkably similar the two games are. The CDS game still holds the edge over ON CUE in my opinion, due to the latter program's cosmetic inferiority and lack of a table-speed facility, although with the added bonus of Pool and a price one third that of the CDS game, ON CUE represents excellent value for money. •



IOCB's - easier than you think!

This issue, as promised, we will delve into the working of the IOCB block. This block is controlled by certain locations in memory and if these locations are POKEd correctly then some great things can be achieved.

When you connect the tape or disk lead into the input/output socket of your computer you have given yourself a choice of eight communication channels, 0 – 7 (remember OPEN #1, etc.?). Each channel has sixteen bytes of memory reserved for it in ROM, from locations 832 to 959. You will be told by various handbooks that you can use all channels for your own use except channel 0 because this is reserved for the screen editor. This is not true, as the 'Forced Read Mode' demonstrated in my last column showed.

Channels 1 to 5 can be used at will. Number 6 is mainly used by the PRINT statement to input characters to GRAPHICS 1 and 2 (for example, PRINT #6; "TEXT"), but can be used as an I/O channel in GRAPHICS mode 0. Due to public demand, I once wrote a column of PEEKs and POKEs in which I mentioned location 703 which would amend GRAPHICS 0. A window would be placed in this mode, normally a full sized screen, and PRINT #6; would have to be used if printing was required on the screen, while PRINT would display to the window.

The last channel, channel 7, is another complicated channel. If you use this channel as your own and try to send something to the printer, an error will occur. LIST (to or from a device) will use this channel, even if it is already open. When finished, LIST will close it. LIST, LOAD, LPRINT, RUN, and SAVE all use channel 7. LOAD and DOS commands close all channels except 0.

WHAT CAN WE DO?

Now we know about the IOCB, let us see how we can use it to our advantage.

Firstly we must let the computer know that we require to use a channel. This is done by

OPEN #A,B,C,D

where A = the channel number you wish to use, B = a command to be implemented, C = an auxiliary code, normally zero, and D = filename (e.g. D:FILESPEC.EXT or C:FILESPEC.EXT).

Although only C: and not the filename is used by the computer to open the cassette, it is handy for future reference to use this approach with cassette based files. Do not worry for the moment about variable B, I will explain this in a later article.

If we go back to the last column regarding storing screens, we can now use a channel to transfer all our stored screen data to or from cassette or disk. Let's assume we have opened channel #1. We can PUT a single byte that had been stored in the variable Z through to our peripheral by PUT #1, Z or we could transfer a string by PRINT #1, A$. The opposite of these commands are GET #1, Z and INPUT #1, A$ respectively. When we have finished transferring data the computer will add an END-OF-FILE marker and the channel should then be closed by using CLOSE #1.

Listing 1 is a program that will open a file named 'SCREEN' on the disk and place the contents of the screen into this file. The screen is then cleared and all the information is taken from the file and placed back onto the screen (note how slow it is). The program can be easily amended for cassette users, but do not forget to reset the tape to the start of the file.

DOING IT IN MACHINE LANGUAGE

All this can take some time if we use Basic. What we need is a handy machine language routine to speed things up. Fortunately, within the operating system of the ATARI there is such a routine which we can access and let it do all the work for us. No need to panic about Assemblers just yet! This routine is the Central Input/Output which calls the Serial Input/Output to drive the serial bus and peripherals. That sounds like deep computer philosophy and I am sure that you have visions of a program with yards of illegible DATA statements, a USR command that does work but you have no idea how, and you may think that this is just another mystery that will be relegated to the realms of 'Life, the Universe and Everything'. Would I confuse you? The USR call has only half a dozen op codes and they are explained fully in Table 1. All that we need to do is to let the CIO know what IOCB we will want to use and the computer will do the rest!

You will note that I am using the PUT *variable* statement. The reason for this is a limitation to the PUT *string* statement. Although the string can be dimensioned to the full extent of spare RAM if needs be (leaving no workspace of course!), the INPUT statement does not generally read strings greater than about 110 characters. This necessitates a FOR/NEXT loop similar to GET. As CIO handles only one byte at a time, it is easier to use PUT/GET routines for fast access times.

ALL IS EXPLAINED!

And now, finally, the long awaited explanation of fast I/O access! As you will notice in Listing 2, line 10120, the code is very short. Listing 2 is the save routine and Listing 3 is the retrieval. Both are very similar in nature and need few changes (aren't I kind?). The graphic mode and screen colours are noted, as is the amount of bytes to move, and the screen memory position to start from. Both of these programs can be used as a basis for any transfer of large amounts of data, such as fonts.

The USR call lets the program be controlled by the CIO routine at location 58454 ($E456). You must tell the routine what IOCB block you will be using (IO in the programs), then

T STEPS.... by Mark Hutchinson

Table 1

ATASCII	DECIMAL	OP CODE	REMARK
h	104	PLA	CLEAR STACK
h	104	PLA	CLEAR STACK
h	104	PLA	GET IOCB BLOCK NUMBER
*	170	TAX	TRANSFER TO X REGISTER
L	76	JMP	GO TO ROUTINE AT
V	86	$56	LOW BYTE
d	228	$E4	HIGH BYTE

The stack is like a column of pop up plates that you would find in a self service restaurant. The last to go on top is the first to come off. When a subroutine is called (via USR) the computer places two bytes of information for its own use on the stack. These we do not need and they are taken off by PLA. The third is the IOCB number (IO) and this is transferred to the X register. The program is sent (jumped) to an inbuilt routine in the Operating System at location 58454 (228*256 + 86). This routine will do all the work for us.

Table 2

INPUT/OUTPUT CONTROL BLOCK.

This consists of eight channels (0-7) each of 16 bytes, from locations 832 to 959. The byte offset (that which is added to the IOCB location) is given below.

OFFSET	BYTES	USE
0	1	Index to device name for current OPEN file.
1	1	Device number (1 for D1, 2 for D2).
2	1	Action to be taken during open command, in our case 11 for PUT, 7 for GET.
3	1	Most recent status.
4,5	2	Buffer address for data transfer or the address of the OPEN file. In our case the Display List pointer.
6,7	2	Address of device's PUT one byte routine.
8,9	2	Buffer length for PUT/GET routines. In our case the number of PUT's and GET's.
10	1	Used to specify file access.
11	1	Used by device driver.
12,13	2	Disk sector number for NOTE and POINT.
14	1	Byte within sector for NOTE and POINT.
15	1	Spare.

use the offset to set the IOCB details. The offsets are detailed in Table 2 and the line workings are explained in Listing 2. The listings will work just as well with the cassette if the device designation is changed from D: to C:.

One last point should be noted. While running the program, the computer is always updating the screen. If the screen was turned off, the computer would operate faster. In fact up to 30% faster in some cases, so use this little code.

P=PEEK (559):POKE 559,0 – This will turn off the screen.
POKE 559,P – Turn on the screen.

ARE YOU STILL THERE?

During the summer months I have received very little correspondence. Does this mean that there are no more beginners reading this column? Or has everybody suddenly become shy? S.A.E.'s as usual to me at **1, Hollymount, Finaghy, Belfast BT10 0GL**

Listing 1

```
FA  9 REM *** Set up screen, get rid of
              cursor. Set up string. Put
              something on screen.
TZ  10 GRAPHICS 0:POKE 752,1:DIM B$(1000):
    LIST :A=1
EU  19 REM *** Open file to save data.
MJ  20 OPEN #1,8,0,"D:SCREEN"
EE  29 REM *** Set up loops to read
               points on the screen.
VK  30 FOR COL=0 TO 23:FOR ROW=0 TO 39
BO  40 LOCATE ROW,COL,POINT
CG  49 REM *** Read screen & save to file
               (CHANNEL #1).
WA  50 PUT #1,POINT
ZZ  60 NEXT ROW:NEXT COL
WT  69 REM *** Close channel after use.
LN  70 CLOSE #1
GO  79 REM *** Clear screen and replace
               everything to screen.
EN  80 GRAPHICS 0:POKE 752,1:A=1
FU  89 REM *** Open file (CHANNEL #1) to
               get data.
KU  90 OPEN #1,4,0,"D:SCREEN"
EQ  99 REM *** Put data on screen.
YN  100 FOR COL=0 TO 23:FOR ROW=0 TO 39
VI  110 POSITION ROW,COL:GET #1,POINT
BC  119 REM *** Screen CHANNEL is #6.
JP  120 PUT #6,POINT
CC  130 NEXT ROW:NEXT COL
EZ  139 REM *** All done, close channel.
LF  140 CLOSE #1
GZ  149 REM *** Pretty slow, huh?
```

Listing 2

```
RC  9999 REM *** CLOSE channel for
                 safety, OPEN to read a
                 new file.
JZ  10000 IO=1:CLOSE #IO:OPEN #IO,4,0,"D:P
    ICSAVE"
OB  10009 REM *** Get graphics mode & the
                  colour registers from
                  file. Set up screen.
IS  10010 GET #IO,MODE:GRAPHICS MODE:FOR C
    =704 TO 712:GET #IO,COL:POKE C,COL:NEX
    T C
LG  10019 REM *** Find Ram top and
                  display list pointer.
BY  10020 RAMTOP=256*PEEK(106):DLP=PEEK(56
    0)+256*PEEK(561)
XE  10029 REM *** Work out variables to
                  be used later.
MA  10030 ADDR=DLP:NUMBER=RAMTOP-DLP+1
TA  10049 REM ***Change IO and set up
                 IOCB for GET operations.
PH  10050 IO=16*IO:IOCB=832+IO:POKE IOCB+2
    ,7
YQ  10059 REM *** Work out address bytes.
LE  10060 ADRHIGH=INT(ADDR/256)
FI  10070 ADRLOW=ADDR-256*ADRHIGH
GE  10079 REM *** Place address bytes in
                  IOCB.
AX  10080 POKE IOCB+4,ADRLOW:POKE IOCB+5,A
    DRHIGH
YA  10089 REM *** Work out no. of GET's.
QP  10090 NUMHIGH=INT(NUMBER/256):NUMLOW=N
    UMBER-256*NUMHIGH
KE  10109 REM *** Place no. in IOCB.
LL  10110 POKE IOCB+8,NUMLOW:POKE IOCB+9,N
    UMHIGH
DZ  10119 REM *** USR call with channel
                  number.
XI  10120 I=USR(ADR("hhh*LVd"),IO)
AC  10129 REM *** All done, close
                  channel.
RC  10130 CLOSE #IO/16
MB  10139 REM *** Much faster, huh?
```

Explanation of Listing 2

Line 10000 opens a file called "PICSAVE" to disk.
Line 10010 places the GRAPHICS mode, held in location 87, and all the colours from locations 704-712 into the file.
Line 10020 finds the top of RAM and the screen pointer for the graphics mode you are using. This will change with different modes as each mode uses a differing amount of memory.
Line 10030 sets two variables for use later on.
Line 10040 changes IO to 16 and adds to IOCB. Channel 0 is at location 832. Channel 1 (our opened channel) is 16 bytes further on. Set the offset for PUT.
Line 10050 works out the high byte of the address.
Line 10060 works out the low byte of the address.
Line 10070 Places the two bytes in the relative IOCB offsets.
line 10080 works out the number of bytes used by the screen. This is the same as the number of PUT's we will use.
Line 10090 places the number of PUT's in the relative IOCB offset.
Line 10100 Activates the machine code routine, held at an address known to the computer.

Listing 3

```
QJ  9999 REM *** CLOSE channel for
                 safety, OPEN to save a
                 new file.
OT  10000 IO=1:CLOSE #IO:OPEN #IO,8,0,"D:P
    ICSAVE"
ZM  10009 REM *** Save graphics mode &
                  the colour registers.
RD  10010 PUT #IO,PEEK(87):FOR C=704 TO 71
    2:PUT #IO,PEEK(C):NEXT C
LG  10019 REM *** Find Ram top and
                  display list pointer.
BY  10020 RAMTOP=256*PEEK(106):DLP=PEEK(56
    0)+256*PEEK(561)
XE  10029 REM *** Work out variables to
                  be used later.
MA  10030 ADDR=DLP:NUMBER=RAMTOP-DLP+1
OW  10039 REM *** Change IO and set up
                  IOCB for PUT
                  operations.
FE  10040 IO=16*IO:IOCB=832+IO:POKE IOCB+2
    ,11
YM  10049 REM *** Work out address bytes.
LA  10050 ADRHIGH=INT(ADDR/256)
FE  10060 ADRLOW=ADDR-256*ADRHIGH
GA  10069 REM *** Place address bytes in
                  IOCB.
AT  10070 POKE IOCB+4,ADRLOW:POKE IOCB+5,A
    DRHIGH
CH  10079 REM *** Work out no. of PUT's.
QL  10080 NUMHIGH=INT(NUMBER/256):NUMLOW=N
    UMBER-256*NUMHIGH
LH  10089 REM *** Place no. in IOCB.
MO  10090 POKE IOCB+8,NUMLOW:POKE IOCB+9,N
    UMHIGH
FC  10099 REM *** USR call with channel
                  number.
XA  10100 I=USR(ADR("hhh*LVd"),IO)
ZU  10109 REM *** All done, close
                  channel.
```

Revision C for Cassette

by Alec Benson

Regular readers will recall that we published a disk version of Revision C BASIC a few issues ago and, as promised in the last issue, we now present a version for cassette users. Why should you need Revision C BASIC? Well some 800XL's have Revision B BASIC which, unfortunately, has a few bugs including a particularly nasty one that adds a number of bytes to your program when you save it, sometimes making it impossible to run the program on other machines.

Before you rush and type in the listing, check to see if you have Revision C already – some machines do. Type ? PEEK(43234). If you get the answer 96 you have the dreaded Revision B! So get typing!

MAKING A BOOT TAPE

Type in the BASIC program, checking it with TYPO 3 as you go, and CSAVE a copy. Next, get yourself a new tape, RUN the program and follow the directions carefully to create a boot tape. Now rewind the tape and re-boot whilst holding down the START key. Do NOT hold OPTION down. Press RETURN after the beep and Revision C Basic will load and run automatically.

After installing itself, Revision C does not use any of the memory that is normally used for BASIC programs. Revision C will remain in memory till power-off as the RESET key is trapped.

```
EI 1 REM ******************************
TA 2 REM * Revision C Basic - Cassette *
SV 3 REM *          by Alec Benson      *
TB 4 REM *                              *
FP 5 REM * First printed by Adelaide    *
HC 6 REM * Atari Computer Club.         *
UU 7 REM * Re-Printed with permission   *
EP 8 REM ******************************
NO 9 REM
AY 10 REM
HF 100 CK=0:DIM A$(170)
JF 110 GRAPHICS 0:POKE 752,1:POKE 710,146
   :? "      MACHINE CODE FILE BUILDER"
WS 120 RESTORE :POSITION 12,10:? "CHECKIN
   G LINE"
PO 130 FOR LINE=1000 TO 1160 STEP 10:POSI
   TION 16,12:? LINE
YF 140 FOR BYTE=1 TO 10:READ NUM:A$(LEN(A
   $)+1)=CHR$(NUM):CK=CK+NUM
OR 150 IF CK>999 THEN CK=CK-1000
UX 160 NEXT BYTE:READ CHECK
VM 170 IF CK<>CHECK THEN ? :? "Error in D
   ATA statements":POKE 752,0:LIST LINE:E
   ND
YU 180 NEXT LINE:? :? "Ready Cassette - A
   fter the beeps press":? " PLAY and REC
   ORD":? :?
EM 190 ? "Press RETURN when ready"
OG 200 OPEN #1,8,0,"C:":? #1;A$;:CLOSE #1
YG 210 ? "▯":? "Boot tape created.":POKE
   752,0:END
WN 1000 DATA 0,2,0,6,237,3,169,60,141,2,6
   20
SP 1010 DATA 211,56,173,250,3,208,105,173
   ,248,3,50
VI 1020 DATA 208,100,169,0,133,216,169,16
   0,133,217,555
VP 1030 DATA 160,0,173,1,211,41,253,141,1
   ,211,747
HN 1040 DATA 177,216,72,173,1,211,9,2,141
   ,1,750
LT 1050 DATA 211,104,145,216,230,216,208,
   228,230,217,755
YB 1060 DATA 165,217,201,192,208,220,169,
   159,133,216,635
XT 1070 DATA 169,6,133,217,169,237,133,21
   8,169,3,89
MU 1080 DATA 133,219,160,8,177,216,145,21
   8,136,16,517
EH 1090 DATA 249,162,0,169,12,133,218,160
   ,0,189,809
OI 1100 DATA 123,6,133,216,232,189,123,6,
   133,217,187
VM 1110 DATA 232,189,123,6,145,216,232,19
   8,218,208,954
WM 1120 DATA 232,24,96,223,168,234,224,16
   8,240,225,788
PC 1130 DATA 168,17,226,168,234,41,187,0,
   243,191,263
YU 1140 DATA 0,244,191,0,245,191,0,246,19
   1,0,571
OS 1150 DATA 247,191,0,248,191,0,249,191,
   0,173,61
```

MORE DEMO MAGIC

from Chris Fox

Most of the demos you see involving 'flowing' colours involve some sort of manipulating of the display list but here demo master Chris Fox shows that you don't need to manipulate the Display List at all, in fact you don't even need to use one! No Display List, no Antic, so how is it done? Ah, that's a puzzle for you to solve, or a secret to be kept from all but the few. Even if the secret proves too difficult to discover, type it in anyway, it's another of Chris Fox's pieces of magic.

```
EI 1 REM ********************************
CL 2 REM * THE  TECHNICOLOUR PROCESSOR *
QS 3 REM *             BY                *
EY 4 REM *        CHRISTOPHER FOX        *
EC 5 REM * ----------------------------- *
IZ 6 REM *  PAGE 6 MAGAZINE - ENGLAND    *
EO 7 REM ********************************
NN 8 REM
NO 9 REM
WR 10 MC=USR(ADR("▯▯▯▯▯▯▯▯h♦")):FOR I=25
   6 TO 449:READ D:POKE I,D:NEXT I:CODE=U
   SR(ADR("▯▯▯▯▯▯Lt▯")):REM BYE BYE!
IX 20 REM ────────────────────────────
LQ 30 DATA 216,169,0,133,16,141,0,212,141
   ,14,210,141,14,212,202,200,32,133,1,20
   1,24,144,247,169,0,141,26,208,173,11
FE 40 DATA 212,201,36,144,249,141,10,212,
   133,1,234,234,234,234,232,136,32,133,1
   ,201,57,144,247,169,0,141,26,208,173
DY 50 DATA 11,212,201,69,144,249,141,10,2
   12,133,1,234,234,234,234,202,200,32,13
   3,1,201,90,144,247,169,0,141,26,208
NR 60 DATA 173,11,212,201,102,144,249,141
   ,10,212,133,1,234,234,234,234,232,136,
   32,133,1,201,0,208,247,141,26,208,198
AU 70 DATA 0,165,0,168,24,105,51,170,169,
   0,141,26,208,76,14,1,169,0,142,26,208,
   142,26,208,142,26,208,142,26,208,234
FT 80 DATA 141,26,208,140,26,208,132,1,23
   4,141,26,208,142,26,208,142,26,208,134
   ,1,141,26,208,234,140,26
RN 90 DATA 208,132,1,141,26,208,234,142,2
   6,208,173,11,212,141,10,212,96,THE END
```



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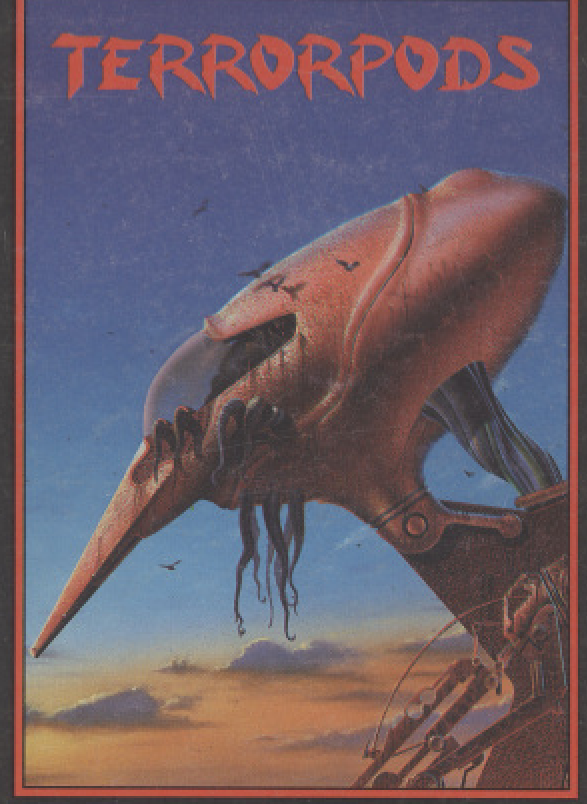
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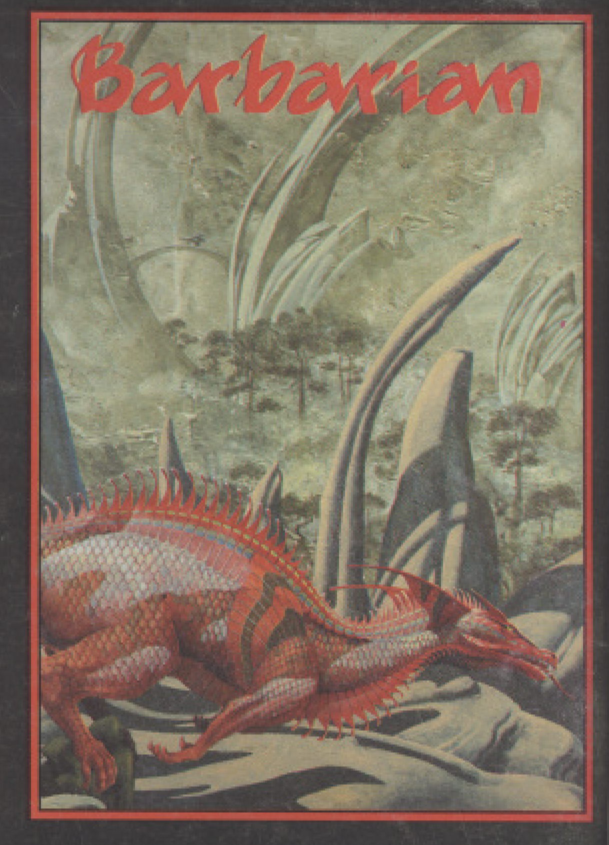
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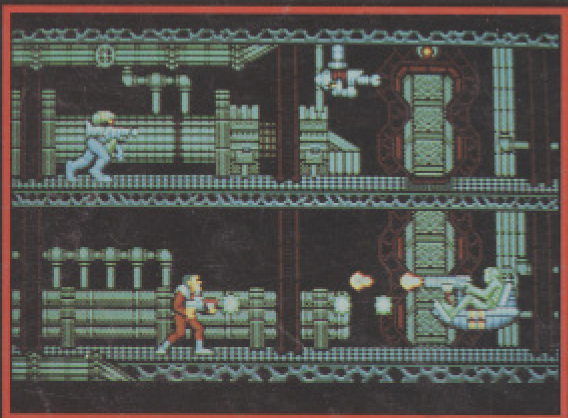
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